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MEEHANS' MONTHLY.

A Magazine of Horticulture, Botany
and kindred subjects.

CONDUCTED BY

THOMAS MEEHAN,

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VOLUME X,
1900.

ILLUSTRATED WITH COLORED LITHOGRAPHS,

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SANGUINARIA CANADENSIS

SANGUINARIA CANADENSIS.

AMERICAN BLOOD-ROOT.

NATURAL ORDER, PAPAVERACEÆ

SANGUINARIA CANADENSIS, Linnæus.—Rootstock horizontal, fleshy and tuberous, crimson-red, surcharged—as also the glabrous, partly glaucous herbage—with orange-red, acrid juice, sending up, in early spring, from terminal, 2-3-valved buds, a long petioled leaf and a one-flowered scape; leaves reniform, palmately and obtusely 3-5-lobed, reticulated; lobes repand-dentate, or 3-lobed; scape a span high, naked (has been found with a pair of opposite bracts and three flowers); petals inch or less long, white, sometimes tinged with rose; capsule two inches long. Gray's *Synoptical Flora of North America*, Robinson's Edition. See also Gray's *Manual of the Botany of the Northern United States*. Chapman's *Flora of the Southern United States*, Wood's *Class-Book of Botany*, and Britton and Brown's *Illustrated Flora of the Northern United States, Canada, and the British Possessions*.

Throughout the whole Atlantic sea-board, from Northern Canada west to Manitoba, and southwardly to Florida, the American Blood-root receives a popular welcome among the early floral harbingers of spring. It is not gathered by the handfuls, and employed to decorate window-sills and parlor-tables, as is the case with the violet and other spring-flowers. Its petals fall so early, and the orange-colored juice, staining the hand of the wild-flower gatherer, prevent it from enjoying this distinction. But to go to the woods to see the Blood-roots in flower, is one of childhood's most appreciated pleasures, when winter is fading away. It is not unusual to find Blood-roots in bloom, in some warm corner, before the snow-drifts in shady places have wholly disappeared. April and May is given in most modern manuals as the time for its blooming; but earlier authors say March and April. In Eastern Pennsylvania, the vanguard appears about the last week in March. They have usually all passed away before April ends. Our early botanist, Clayton, who furnished the material and notes for Gronovius' *Flora Virginica*, published at Leyden in 1743, says it is the first spring-flower,—and that it was called Puccoon by the Indians of Virginia, because of the orange-colored sap that oozed from the roots when broken.

To watch the appearance and the development of the flowers, is, indeed, one of the pleasures of the lover of wild-flowers. In many cases, stipules or the dilated bases of the leaf-stalk are reduced to bud-scales for protective purposes. But in the American Blood-root, the leaf-blade itself performs that office. They enfold the bud, and resign the protectorate at once, and enter on the usual duty of a leaf-blade after a few warm admonitives from the springtide's sun.

Many happy thoughts might inspire our poets by a closer acquaintance with our wild-flowers. Their comparative neglect is in a great measure due to our early studies in English literature. Names, that we are accustomed to in early life, naturally occur to us when we want a word. The wind-flower, *Anemone nemorosa*, by reason of this association, thrusts itself forward in many cases, when its companion flower, the Blood-root, might serve the poet's purpose just as well. In Bryant's beautiful poem, "The Death of the Flowers," he sings:—

"The wind-flower and the violet, they perished long ago,
And the wild rose and the orchis died amid the summer glow;
But on the hill the golden-rod, and the aster in the wood,
And the yellow sun-flower by the brook, in autumn beauty stood,
Till fell the frost from the clear cold heaven, as falls the plague on men,
And the brightness of their smile was gone from upland glade and glen."

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COLOR PLATE
INTENTIONAL SECOND EXPOSURE

In Gordon's Winona, we may surely hope to find it.

"The long winter wanes. On the wings of the spring came the geese and the mallards;
On the bare oak the red robin sings, and the crocuses peep on the prairie,
And the bobolink pipes, but he brings, of the blue-eyed, brave White Chief, no tidings.
With the waning of winter, alas, waned the life of the great Tatépsin;
Ere the blue pansies peeped from the grass, to the land of the spirits he journeyed;
Like a babe in its slumber he passed, or the snow from the hill-tops in April;
And the dark-eyed Winona, at last, stood alone by the graves of her kindred."

Our Puccoon might have found a place in these vivid lines.

The Indian name Puccoon was employed by the Indians, as Clayton notes; but its derivative is not known. The juice is said to have been in use, by these early inhabitants of our country, to paint ornaments on their bodies, in common with the juices of other plants, to which they gave the same appellation.

Mr. H. R. Noll, in his "Flora of Pennsylvania," says that the Blood-root has been employed in emblematic floral language to represent "flattery's smile." The appropriateness of the association is manifest to all familiar with the short duration of the flowers. In a very little while after the expansion of the blossom, the petals fall, just as the early withering of flattery's smile is reputed to do. Brief life is, however, characteristic of the whole order of *Papaveraceæ*, or the poppy family, to which the Blood-root belongs. Another characteristic of the family, in which the blood-root literally shares, is a milky juice which usually turns to a dark brown or reddish color when in contact with the atmosphere. This juice is frequently narcotic, of which the opium of commerce is a familiar example. Opium is derived from *Papaver somniferum*, or the sleep-bearing poppy.

The juice of the *Sanguinaria* is so dark, that one of its common names is red-root, and the botanical name is derived from this blood-like color. "This genus was named from its bloody root," says Rafinesque, in his "Medical Flora." The same author says, "it is one of the most valuable medical articles of our country. It is an acrid narcotic, emetic, deobstruent, diaphoretic, expectorant, vermifuge, escharotic, and at the same time stimulant tonic." It is dangerous in large doses. He gives a long list of diseases and disorders in which it has been found useful, and, he says, "It is the base of some patent medicines popular for jaundice." In the Old World, it was sought for in the early intercourse with the botanists of our country, on account of its medical fame. The famous Peter Collinson had it in his garden, and wrote to John Bartram, in 1767, that "The Puccoon was in flower on April the 5th." A year later, Dr. Benjamin Gale, of Killingworth, wrote to John Bartram, "I want to know the botanical name of the American Blood-root. Its virtues are great and many; particularly I look upon it as a specific in nervous headache, or sick-headache, as it is commonly called." To those, however, who desire a knowledge of the real value of the plant in medicine, the writings of George Gibbs and Robert Bentley, in the *Journal of Pharmacy* for 1860 and 1862, will be instructive.

The botanical student will find the *Sanguinaria* especially instructive. The leaves and flowers are illustrative of a remarkably wide variation. In the early history of botany, when the idea of a species was much more definite than at the present time, some of these variations were regarded as constituting distinct species, and they were awarded specific names accordingly. These are now all included under the general term *Sanguinaria Canadensis*. The petals vary from almost round, in extreme cases, to so long and narrow that the latter was once known as *Sanguinaria stenopetala*. In number, too, the petals are very irregular. As many as twenty may be occasionally counted. Usually white, they are often of a pinkish or even of a bluish tinge. Pursh observes that a skilful florist might readily obtain a perfectly double form by judicious selection. The leaves vary remarkably. At times, they are so deeply lobed, that they might be almost termed digitate or palmate,— at other times one may find plants with leaves almost reniform, with the barest suggestion of a lobe at the apex This variation is found in plants growing side by side.

EXPLANATION OF THE PLATE.—Plant, with seed-vessels, from Eastern Pennsylvania.

WILD FLOWERS AND NATURE.

ENDLESS BEAUTY

Oh, there is not lost
One of earth's charms: Upon her bosom yet,
After the flight of untold centuries,
The freshness of her far beginning lies,
And yet shall lie. BRYANT.

CYPRIPEDIUM ACAULE.—I have found *Cypripedium acaule* beneath the trees of dense pine woods, where the ground was three or four inches deep with pine needles, and its companion plants were *Chimaphila umbellata* and *C. maculata*, in the State of Maryland, a county near and bordering on Black Walnut Creek. Of course, the land must have been dry when the pine trees, growing very near together, sucked up all the moisture; and the shade was dense, the sunlight never reaching the ground.

Festus, Mo. F. K. STEELE.

A point of leading interest in this matter is the modern belief that species came into existence with a change of conditions,—that is to say, plants change from one species and become another when their surroundings change. In this case, we have a plant which is at home in the dry, shady pine woods of Maryland, equally at home in the open, sunlighted swamps of Michigan. On the basis of another hypothesis, that all plants have wandered from a central home, the change from one to the other condition had no influence in changing the specific characters of the plant.

CRANBERRIES IN NORTHWESTERN PENNSYLVANIA.—In reply to Mrs. Eby's query, in August issue, permit me to say that cranberries have been found, for many years, in at least two swamps in Crawford County.

In the southwestern part of this county, and extending westward to the Ohio line, is a swamp several miles long. Near *terra firma*, the larger growth is mainly of alder, with poison sumach, bayberry and huckleberry interspersed. Farther in, tamaracks predominate. And in the center is an open "prairie." I have often heard my father relate how th people, for miles around, congregated about this swamp, in cranberry season, removing their foot-gear and wading knee-deep into the bog to gain its treasures by the bushel.

Though less plentiful than of old, they are still found in this swamp,—a bountiful supply some seasons. The writer has gathered the vines and immature fruit for botanical specimens; but has never been in the swamp at the season to secure ripe fruit.

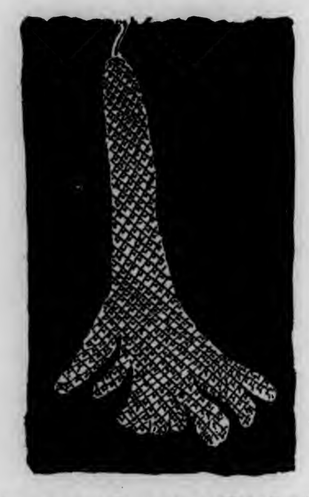
The other station is in the same county, a few miles farther northeast, and about a mile and a half north of Conneaut Lake, the largest inland lake of Pennsylvania. This swamp is comparatively small, comprising considerably less than two hundred acres, and a portion of it contains fine marl beds. Some of the oldest Indians here, at the time of the settlement of the country by the whites, claimed that they could remember when it was an open lake.

Harmonsburg, Pa. BESSIE L. PUTNAM.

SANGUINARIA CANADENSIS.—The Blood-root was at one time known as a *Ranunculus*, and is described in an old work, by Parkinson, as *Ranunculus Virginiensis albus*, and it is indeed not easy, at times, to distinguish the two orders, except by the colored juice. It has also been referred to *Chelidonium*. Morison notes that it was cultivated in England in 1680, from seeds either from Canada or Virginia, and was called *Jacobe*, from a merchant named Jacob.

A BRANCHING CATKIN.—What were once termed monstrosities, and passed over as the work of some malignant power opposed to the regular order of Providence, are now welcomed, by the student of the life-history of plants, as opportunities for learning what the regular order of nature really is. In the present case, we have a sketch of a branching ament or catkin from the American Hazel-nut, *Corylus Americana*, the specimens kindly sent

by our observing correspondent, Mr. C. F. Saunders. The specimen selected is the one most profusely branched, and, indeed, assumes, somewhat, the character known to botanists and florists as crested. Some of the less divided specimens show the purely branching character better than this one does. There is, however, no reason why a catkin should not branch, as it is, itself, but a modified branch,—and the surprise might be that we do not meet with cases often. Every little scale in a catkin is but an arrested leaf, and the stamens at the



BRANCHING CATKIN OF AMERICAN HAZEL
(TWICE ENLARGED)

base of the catkin are modifications of an axillary bud. Just as in the case of a rose branch sometimes appearing from the centre of a rose flower, we might look for a real branch, instead of a modified one, appearing from the axis of a scale.

People seldom stop to consider that the transformation of a branch into a catkin, such as those of the hazel, is among the most wonderful of natural phenomena. On a good, healthy hazel catkin, these will be, at a moderate computation, 500 scales. If these had been developed to a true stem with leaves, the branch would be, with the leaves two inches apart, over 80 feet long! We know, of course, that life-energy would be exhausted long before a branch could be developed to that extent; but we see that nature really prepared the model for this extraordinary growth, though she might be unable to accomplish it.

Reason and Judgment in the Lower Orders.—One day, in the middle of October, the writer tested an apple, partly rotten, and threw the remains into a waste paper box under the desk. It was soon covered by paper waste. The windows were half open, for it was an unusually warm October day. Bees and honey-loving insects had long been to rest. A solitary "yellow-jacket" entered the open window, and steadily searched every cranny of the room. At length his search among the waste paper indicated what he was looking for. He soon made up his mind, however, that the apple remains were too deeply buried in the box for him, and gave it up. Satisfied of this, he did not hunt around for other things, but slowly, and in a manner dignified, went to the window for his departure. He went too low, against the glass, and not to the opening above. But here he imitated human nature. Seeing nothing, for the glass was very clear, he must have taken his sudden stoppage as the work of a ghost. He tried and tried again at other windows, with a like failure. At length he halted, and seemed to turn philosopher, and was evidently reasoning on the situation. His next flight was across the room, but towards the real opening, by which he again emerged to the outer world. A correspondent recently suggested that insects and other creatures may have keener scent than they get credit for, and do not need color to guide them to honeyed secretions to near the extent sensational writers would have us believe. This incident proves this. The solitary wasp must have scented this rotten apple from a long distance. It was guided to the spot by good judgment,—and by good judgment gave up the pursuit when it reasoned that the prize was hopeless. It did not get confused at its first rebuff against the glass, but knew that if there was a place to get in, there must be a place to get out. It went cooly to work on that line, to final success. And all this, according to old authors, is blind instinct. To our mind, if it be not reasoning from facts, and subsequent judgment on them, there is no such thing as reason and judgment in the world.

GENERAL GARDENING.

SWEET LABOR.

I love my garden well
And find employment there;
Employment sweet, for many an hour,
In tending every shrub and flower
With still unwearied care.

Mrs. Southey.

Street Trees.—In most city improvements, matters are so arranged that the cost is equally divided between the owner of the property benefitted, and the general tax-payer. In relation to street trees, the cost, care, and, indeed, the whole question, is at the sole discretion of the owner of the street front. It would seem that, as the general citizen profits both in health and general pleasure by the street tree, it should be a matter of municipal interest equal to any other; but it is doubtful whether the property owner would care, in the long run, to lose absolute control of the sidewalk tree. A variety that the city might choose for him might be objectionable in many ways,—and there might, at times, be very good reason for taking it away entirely. This is especially true of a street which has changed its character from one of residence to that of business. The architecture and the business sign must be seen by all the world,—and the tree has to go. However, the matter is one for fair discussion. Prof. Sterns, of the State University of Athens, Ga., before the Georgia State Horticulture Society, told what it might cost from the municipal standpoint he advocated:—

"No such gruesome apparition as great cost, that usually frightens the legislator, however, is injected into the suggestion of street shading. The cost is so slight—particularly when the owners of the frontage to be improved share the expense, as is customary with other street improvements—that neither corporations nor individuals are seriously inconvenienced thereby. Careful investigation and figuring disclose the fact that the cost of street-shading will average about one cent per linear foot of frontage for the purchase and planting of the trees. Thus, the cost to a 50-foot frontage would average, if the owner bore half the expense and the city the other half, some 25 cents. As a matter of fact, it would be, for a frontage of 50 feet, either 20 or 30 cents, according to the number of trees (20 feet apart) chargeable to same."

Mistletoe.—In response to R. H. W., in Meehans' Monthly, for November, the article reminds me of having read, sometime since, that the guibel or mistletoe grows on apple trees in England, and is propagated upon them purposely. Before reading it, I supposed the parasite not desirable,—at least upon fruit trees. Chamber's Encyclopædia says the mistletoe is a native of the greater part of Europe, growing on the apple, pear and hawthorn; also on poplars, firs, and other trees, but seldom on the oak." It is plentiful in some parts of the South of England, its evergreen leaves giving a peculiar appearance to the orchards in winter, when the bushes of mistletoe are very conspicuous among the naked branches of the trees; but it is very local. It is not a native of Scotland, though found naturalized in various places. * * The berries are full of a viscid juice, which serve to attach the seeds to branches, where they take root when they germinate, the radicle always turning towards the branch, whether on its upper or under side."

When on Cayamaca Mountain, I observed a mistletoe upon the cedar trees and a different kind upon the oak and still another upon the pine, though the characteristics of the three were much as described in Gray's Botany, that says "the American mistletoe grows from New Jersey to Illinois and southward, preferring elms and hickories." The mistletoe has an interesting history and many attractive things might be said about it besides the above brief quotations. And the pitcher-plant, the mere slight allusion to it, calls up so many pleasant memories; also the Hibiscus, especally a reminder of the little African Hibiscus,

familiarly called the flower of an hour, is very suggestive of the brief, beautiful and lamented life, of many a human flower.

San Diego, Cal. MRS. E. E. ORCUTT.

PALM HOUSE, PHIPPS' CONSERVATORY.—Geologists tell us that the early vegetation of the earth was devoid of beauty,—that handsome flowers appeared only with the incoming of man. But there was at least a grandeur in the aspect of vegetable nature that would have excited his admiration, as the horticultural structures known as Palm Houses well show, when filled with samples of the plants that are the allies of those that monopolized the earth in its early days.

What this early world was like, is well illustrated by a view in the Phipps' Conservatory, in Schenley Park, which, by the kindness of The Lord & Burnham Co., we are enabled to place before our readers. In the foreground, passing over the dwarfer vegetation, we have a specimen of the Norfolk Island Pine, close relatives of which are found in a fossil state. Bamboos, palms, bananas, and ferns make up the chief part of the rest of the inhabitants of the conservatory. It furnishes a valuable object lesson as to the appearance of our ancient world.

VIEW IN PALM HOUSE, PHIPPS' CONSERVATORY, SCHENLEY PARK, PA.

HARDY AZALEAS.—During the month of May, nearly all, of what are called hardy azaleas, bloom, having in mind the Northern States, principally. Beautiful as the flowers are, they are often not as satisfactory as they might be, because of being planted in unsuitable places. Azaleas are naturally shade-loving plants, and besides this the flowers are far more lasting when in partial shade than when in the full sun, yet rarely are they seen in other than a situation entirely exposed to the sun.

Quite recently, it grieved me to see a lovely collection, consisting of Mollis, Ghent and other hybrid sorts, so exposed, and the flowers drooping, though not an over-hot day. It is not meant that they should be planted directly under trees, but in situations where large trees will partially shade them, or where buildings or like objects will effect the same object.

It is generally understood that azaleas love light soil, but this must not be thought to mean a poor one. It has to be light and fine, because of the thread-like roots these plants have, which cannot endure a heavy soil.

Hardy azaleas, as mostly seen in collections of to-day, consist of the native *calendulacea* and *nudiflora;* the Chinese, *mollis;* the hybrids known as Ghents; and, in the vicinity of Philadelphia, *Indica alba* is included. The little evergreen one, *amœna*, flowers earlier and is not often used in connection with the others, but in beds by itself. *Vaseyi* is a beautiful native sort coming into general cultivation; and the summer flowering one, *viscosa*, a native of low woods in many of our States, is better known than it was.

I have kept the name azalea, as it is the commoner one, though Index Kewensis makes rhododendrons of them all.

JOSEPH MEEHAN.

A SUBSTITUTE FOR HOLLY BERRIES.—Whenever we illustrate, speak or think of the holly, the bright scarlet berries are almost invariably associated with the leaves. They are the enlivening parts of the tree, the leaves, aside from their rich green color, being attractive largely by their oddity.

Unfortunately, the berries are usually fewer in proportion to leaves than man would like, as they have their time-honored uses at Christmas in decorations of various character. Some trees are deficient in the sexual organs of their flowers, and, therefore, entirely barren. The gatherer of Christmas greens for market is very often obliged to substitute the more abundant berries of the Deciduous Holly, *Ilex* (or *Prinos*) *verticillata;* while the unsuspecting public recognizes the leaves and fruit simply as holly. It can hardly be said they are victims of misrepresentation, for the substitution is to the eye hardly noticeable, and the family relationship is certainly very close. The chief objection to the substitution is that the scarlet berries lack lustre, and are inclined towards an orange-red at times.

In the far northern States and Canada, where the evergeen holly is not indigenous, the Deciduous Holly offers excellent opportunities for decorative purposes,—not necessarily in connection with the real evergreen leaves, but in other combinations, which the artistic eye can always devise. If desired, the evergreen branches might easily be obtained from farther south, while the natural berries would not so readily stand shipping.

The natural haunts of either holly, but most particulary the deciduous species, are in low, moist situations, although in cultivation they may be brought to higher grounds satisfactorily. When abundantly furnished with their bright berries, the effect is very pleasing.

CYPRIPEDIUM INSIGNE—A HOUSE ORCHID.—One of the most popular orchids grown for cut-flower purposes is *Cypripedium insigne;* and it is also valuable as a house-plant, though possibly seldom so grown. Its spikes of solitary flowers on stiff stems make it the most convenient orchid to have about a house; and the lasting quality of the flowers—from four to six weeks each—makes the plant equal to many that produce more flowers, but individually last but a short time. The quaint "Ladies'-slipper" flowers open a brownish yellow in color, turning quite yellow with age. When growing and blooming, an abundance of water is welcomed, provided the drainage be perfect. They are usually grown in pots, packed with moss or peat. During the summer, they may be kept barely moist and partly shaded.

THE SASSAFRAS AS AN ORNAMENTAL TREE.—Mrs. Seliger has the following note on a tree well worthy of the praise she offers:—

"We do not honor enough the sassafras. It should be planted more for decorative purposes, whether as shrub or small tree. Its dark scarlet foliage in late autumn is exceedingly handsome, and at all other times it is one of the best native things we have. The early blossoms, when the bush is not yet in leaf, the

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INTENTIONAL SECOND EXPOSURE

diverse shaped, thick leaves and later the blue drupes held in a scarlet, waxen cup when ripe, are attractive."

MINERALS IN PLANTS.—Mr. Charles Henry Baker, Grasmere, Orange County, Florida, is struck by the great luxuriance of vegetation in that section of the country, *Leguminosæ* in particular, of many genera and species, being especially exuberant, and yet the soil from the chemical standpoint should be among the poorest of the poor. He furnishes the following table of analyses :—

Composition of Florida Pine-land Surface Soils.

Coarse material, .	8.10 p.c.
Fine, ...	91.90 p.c.
Humus, ...	0.4100 p.c.
Nitrogen, . . .	0.0412 p.c.
Moisture at 100°c,	0.3187 p.c.
Insoluble residue (silicate),	97.1318 p.c.
Potash, ...	.0057 p.c.
Soda, ...	.0411 p.c.
Lime, ...	.0225 p.c.
Magnesia, ...	.0213 p.c.
Ferric Oxide and Alumina, .	.7772 p.c.
Chlorine, ...	truce
Phosphoric Acid, ...	.0898 p.c.
Sulphuric Acid, ...	.0067 p.c.
Carbonic Acid, ...	.0047 p.c.
Water and Organic Matter, .	1.8088 p.c.
	99.9096

In this it will be noted that the proportion of the alkalies is ridiculously small, potash especially so. He remarks on this :—

"One would think that this would be soon exhausted and in many places be entirely unrestored. Some few of these Leguminosæ, like *Erythrina*, have fusiform, deep-seated roots ; but then the subsoil is even poorer than the surface. In the uppermost foot, or less, of the surface, all our culture is done, for we usually turn over from 6 to 9 inches. Deeper plowing, for any reason, will throw us off for some seasons."

Similar problems have occurred to others, but have had no satisfactory solution. It has been stated that a very large amount of oxalate of lime is found in cactuses that may be growing in soil that has little appreciative lime in its composition,—and mineral matters not supposed to be to any material extent in the atmosphere are found in quantity in the ash of air plants, the Spanish Moss, *Tillandsia usneoides*, being particularly alluded to. The exact references are not at hand,—but it has been repeated so often as to be accepted as fact.

It cannot be assumed that something, not even an element in chemistry, can come from nothing,—but there is a bare possibility that even the element of the chemist may be a compound, and that the mysterious force, we call life, may have a power of combination that the human intellect has not yet unfolded to us.

VARIATION IN SEEDLINGS.—The law of variation operates in everything. In no one particular respect do individuals resemble absolutely their parents. Even in the time of flowering there is a variation. Some individuals will bloom earlier and some later than others. This has been more particularly marked in the more showy-flowered of our ornamental trees. In the *Koelreuteria*, this particular variation is striking. In one hundred trees, all raised from the same package of seeds, there will be as much as three weeks of difference in the time of flowering. Possibly the sexual variation may have something to do with the difference in the flowering time, as certainly it has to do with the showiness of the blossoms. As it is the case with so many American and Japanese trees, there is a great tendency to a division of sexes. Some *Koelreuteria* trees are wholly barren, while others are abundantly productive. The barren trees have rather larger flowers, and are more showy in every respect, and, so far as our somewhat limited experience in this respect goes, are among the first to flower. This little difference in this respect has not been noticed by cultivators as it deserves to be.

USES OF EVERGREEN BRANCHES.—The number of uses to which the evergreen bough or smaller branches can be put is never wholly appreciated. For winter protection of Rhododendrons and other broad-leaved evergreens, they are unsurpassed. In place of the unsightly board structure or corn-stalks frequently arranged around the plants, drive four or five stakes, or as many more as deemed necessary, around the bed or group, as close to the plants as practicable ; string wires to each ; and stack and fasten the cut branches around and partly over them. After completion, from a distant point, the group simply represents a mass of evergreens quite appreciable in winter. Hemlock branches are most adaptable, being neat and graceful, and will last well through the winter.

They may be used to great advantage in the cemetery for covering freshly-made graves, where it is impossible to sod or cover with vines before spring or early summer. Neatly arranged, the effect is very grateful. The custom of "lining" graves with evergreens, fastened in a wide-meshed wire cloth, is getting quite common, and is, indeed, a pleasing thing.

Besides Hemlock Spruce, the arbor-vitæ is found desirable, and particularly adapted because of the flatness of the twigs.

Larger boughs are used to weigh down leaves, where used as a mulch, preventing their displacement by the winds.

RAPID GROWTH OF A HOLLY.—*Ilex opaca* is justly considered of slow growth, among the most tardy. Three of my plants, bought about four years ago, planted on my grounds, show this year a great exception. One three feet six inches high, last spring, has sent up a leading shoot, four feet six inches long ; and two other plants have each double shoots of four feet length—and all are stout in proper proportion.

T. WISTAR BROWN.

Philadelphia.

STREET TREES.—The city gardener of Springfield, Mass., recommends that side-walk trees should be planted on the lawn sides, and not on the curb sides of the avenue, in cases where the houses are set back, so as to allow of a small plot in front to the side-walk line. This has some advantages. On the other hand, with tree-trunks so near to the lawn, the roots would make the lawn so dry, that not even grass would thrive during hot summer weather. It will depend on circumstances which method is best.

THE WALL-FLOWER AND QUEEN VICTORIA'S GARDENING.—Queen Victoria's healthful longevity is attributed in great measure to her outdoor pleasures, of which her love of gardening is one of the strongest traits. She is said to be so well informed on gardening topics as to be able to recognize the merits of a good gardener over a mere pretender. Her friends were in the habit of getting her to select gardeners for them. The great eminence of the gardens at Laeken, near Brussels, owned by the King of the Belgians, was the work of an English gardener named Henry Knight, whom the Queen recommended.

She has a great fondness for old-fashioned flowers, the old wall-flower being an especial favorite. Large quantities are raised in her private garden at Osborne, and the cut-flowers shipped regularly to London.

There are few odors more grateful than that presented to us by this wall-flower, and it is remarkable that more of our enterprising florists have not taken it up, for it is rarely seen, now-a-days. Possibly the ease with which it is grown would soon cause the market to be over-stocked, and it would not yield paying prices. But it should find favor with amateurs.

FUNGUS ENEMIES.—A foreign paper states that America is a famous country for fungus, as well as being famous for many things ; but it is remarkable that nearly all the western plagues of this character are imported varieties from the Old World. Americans are famous for hunting up and discovering the nature of these small organisms. Possibly a closer study is made of them in America, than in any other part of the world ; but very much more is known about them and about their destructive habits. More than that, we know better how to *keep* them than cultivators know.

NEW OR RARE PLANTS.

STUARTIA.—The family of plants, to which the tea plant and the camellia belong, is known as *Ternstroemiaceæ*, from a very large genus, *Ternstroemia*, which abounds in Asia and South America. In North America, the only representatives are the very rare *Gordonia*, or Franklin Tree, and two species of *Stuartia*, also comparatively rare. They are rare in American gardens, because the seed is difficult to procure, and their artificial propagation is slow. The following notes, on other hardy species from Müller's *Garten-Zeitung*, will be interesting in this connection :—

Stuartia Pseudo-Camellia, *Maximowicz*. A beautiful, ornamental and hardy shrub, distinguished by its very large, white flowers, is

indigenous to Japan and belongs to the family of *Ternstroemiaceæ*—more lately termed *Theaceæ*. Unfortunately, it is of slow growth and will not bear flowers until it has arrived at a certain height; but then it will be covered with abundance of the large, white flowers, 5 cm. in diameter. The beauty of them is enhanced by anthers of bright orange-yellow color and in connection with the shining, green foliage, it furnishes one of our most attractive flowering shrubs.

Stuartia Pseudo-Camellia Maxim. Syn: Stuartia grandiflora Sieboldi, reaches, in its home, a height of 15 m., forming, under culture, a dense, bushy shrub with elliptic-lanceolate leaves, 5 to 8 cm. long and from 2 to 3 cm. broad, slightly serrated, smooth on the upper and sparsely silken-haired on the under surface. The flowers grow in the axils of the leaves, are disk-shaped, 5 cm. in diameter and appear in July; the five almost round, incised petals are covered with silky hair on the outside. The plant is little known outside of Japan. Thirty years ago, it was introduced into the United States, and it is likely that it found its way into Germany from here. Successful cultivation requires a rich, deep soil and a sunny situation. Propagation is accomplished either by seed or slip; the latter requiring considerable time for rooting.

Translated by H. Cramer. A. RHEDER.

GOLDEN-LEAVED PAMPAS GRASS.

GOLDEN-LEAVED PAMPAS GRASS.—Among many interesting novelties on the grounds of Professor Emory E. Smith, of Palo Alto, California, is a variety of Pampas Grass that has a deep stripe of gold down the centre of the narrow, grassy leaves. The plume-stalks are also very long, rising chiefly ten feet from the ground; and the plumes are fully formed quite two weeks earlier than the common variety. The plant illustrated is three years old, and the mass of leaves is about four feet above the ground.

THE HARDY FLOWER GARDEN.

HARDY BORDER PLANTS.—One of the most useful and satisfactory adjuncts to any garden, whether it is a part of a large, well-kept garden, or the more humble cottage of the artisan, is a border of the ordinary old garden favorites. They are so easy of cultivation, requiring absolutely no care. They do much more satisfactorily if any little attention is given them; yet they will bloom profusely with very indifferent treatment. Many are at the present writing one mass of bloom, being very attractive in the garden as well as useful for cut-flower purposes. We have, here, such a border, which has received no manner of attention, yet the Antirrhinums, mostly white, are superb. The columbines, of which we have several pretty varieties, are extremely handsome. The old-fashioned Canterbury Bells survived the winter and are now one mass of pretty, bell-shaped flowers. The little formal, sedate *Dianthus*, which grows so compactly, literally covered with flowers. This evening I counted upwards of 128 blossoms on a small clump. The flowers are of many colors and shapes, and exceedingly showy in the garden. *Heuchera sanguinea* is a grand little plant, deserving a place in every garden. The flowers are on long stems, of a pretty, scarlet color. For filling any space in the back-ground of the border, there is nothing better than the annual corn flower (*cyánea*). We have now quite a number of self-sown plants, in full flower. They are deservedly popular for cut-flower purposes. The foliage is very graceful. For the front edge of a border there is nothing will present a neater appearance than the little *Armeria*. It flowers in May and June, is very compact, and for edging purposes it is very appropriate.

I would like to see this class of plants more largely planted. They are not subject to any insect attacks, and are at all times a source of interest and pleasure to all. CLOVERLEY.

FRUITS AND VEGETABLES.

MAKING PUMPKINS.—The average newspaper reporter often shows ingenuity in the manufacture of "fakes." The following, from the Portland *Oregonian*, is worthy of a place in the "Arabian Nights." Unfortunately, they too often become "truths of history" to smart magazine writers:—

"Will you believe me when I tell you that I found a man out in Prineville who had established an industry of furnishing pumpkins of a given weight to ambitious farmers who desire to take prizes at the county fairs? How does he grow them? Simple enough, when you know how. This pumpkin manufacturer feeds the pumpkins milk,—just good, rich milk, and when the pumpkin has grown to the weight called for in his order from the ambitious farmer, he cuts it from the vine and turns it over to the one ordering it."

"This is the manner in which he does it: Every day he fills a quart vessel with milk, places it on the ground, and connects it with a slit in the pumpkin vine with a rubber tube. The vine draws in the milk by capillary or some other attraction, and the vine thrives and it grows to enormous proportions."

"It was extremely interesting to go out in the evening to the pumpkin factory and see the owner feed the pumpkins. The vines had become so used to it and appeared to like the milk so well that they actually rustled as the man with the milk approached, and the big broad leaves waved in a transport of delight; and when the milk had been consumed the vines settled down for the night, as contentedly as a band of cows chewing their cuds."

SCHOOL GARDENS.—In the public schools of many towns and cities, the pupils sow seeds and watch their development, even in those schools where the window-sills alone constitute the garden ground. A very good idea is worked out in Landreth's Seed Catalogue, by selections of seeds that grow easily under these conditions, with instructions for managing them.

PRESERVES AND MARMALADES.—A sample of marmalade sent by Mrs. A Millard, of Plattsburg, New York, made from the pods the Chinese Mandarin Rose, was of such unusual excellence that, at our request, she has kindly sent us the following recipes:—

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"The fruit of *Rosa rugosa* is the most suitable for preserving as the pods are large, fleshy and of high color. To make marmalade, the pods want to be picked fully ripe, yet before the frost touches them.

Wash, trim and seed the pods, cover with water, steam until tender, and strain. Mash through a colander with a wooden spoon, and add to 1 pint of the pulp ¾-pounds of granu-

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INTENTIONAL SECOND EXPOSURE

lated sugar. Put on to boil and constantly stir for twenty minutes or more, then fill in jars or jelly glasses."

Rosepod Preserves.

"Wash, trim and seed the pods, cover with water and boil for five minutes then strain.

Boil to a syrup 3 pounds of granulated sugar, ½-cup of vinegar, ½-cup of water, skim until clear. To this add about 4 pounds of the par-boiled rose pods to boil on a moderate fire for one-half to one hour.

Neither preserve calls for any spices, as it would take away the fine flavor of the fruit itself.

Yet, if spices are desired, they ought to be added whole, a *little* of ginger-root, cloves and stick-cinnamon, which must be taken out afterwards."

NEW WASHINGTON WAKEFIELD CABBAGE.—For many years the Jersey Wakefield Cabbage has been the most prominent early sort with market gardeners, and many attempts have been made to improve on it, with but limited success. The Iowa Seed Company, Des Moines, Iowa, announce a new variety under the name of Washington Wakefield, which they claim superior as an early variety. They claim for it larger, solid and more uniform heads. Valuable for either market or family garden.

POTATO EYES BY MAIL.—A convenience that will commend itself to persons interested in testing new varieties of potatoes is the practice adopted by John A. Salzer Seed Co., of sending small quantities of eyes by mail packed in moss.

JELLY FROM THE HIBISCUS.—Those who understand the great value of the okra, in high class cookery, will not be surprised to learn that another member of the family, *Hibiscus Sabdariffa*, is proving to be a jelly-maker equal to the red currant. The article is selling under the name of "Roselle."

AMATEUR FRUIT GARDENING. — Travelers from the Old World tell us, that though peaches are abundant in our markets, yet, in size and quality, they do not equal the best specimens of English gardening. But this is not surprising, as the educated intelligent gardener can beat nature, easily, when he tries. In peach-growing, the gardener who grows them under glass is able to protect the trees from insects and microscopic funguses much more readily than can the orchard grower,—he can prune the trees so as to ensure the best results from the branches left to bear,—he can thin the fruit in an early stage. and give water or withhold it just as the trees need. The peach needs no artificial heat but that which the glass enclosure affords.

The London *Journal of Horticulture* tells of an orchard house—as these glass structures are termed—covering only a space of 150 x 30, that has had large crops annually for twenty-four years. The correspondent visited the house last July, and found these few trees carrying 3,000 peaches, running from 12 to 16 ounces in weight, and all in the rudest health.

Of course, the intelligence of the person in charge counts for much. It is not always that the right person gets into the right place. The writer of this paragraph knew of an amateur who thought to carry out, in America, a peach house on the style he had seen in England. But in a few years, the peach trees were wholly destitute of branches near the ground, and the only foliage was on strong shoots up against the glass, and these were covered with insects to such a nauseous extent, that the owner, in disgust, had to tear the house down. The conclusion was, that orchard houses would not do in America. Wiser ones could give a different answer. This difficulty is not confined to America, for it is a constant complaint, that sound, practical skill is becoming rare in the Old World as well. The case of superior skill, referred to by our London contemporary, is in the Isle of Wight, at Brook House, the good gardener's name William Tribbick.

HUBBARDSTON NONSUCH APPLE.—It is not an easy matter to recommend certain varieties of fruits. What one person likes, another may care little for; and one kind that does well in one locality, may be poor not far away.

An apple that seems to appeal to the taste of many, is Hubbardston Nonsuch, a large red apple, somewhat striped, ripening in early winter. There is a flavor about its yellowish flesh that is very rich. It may be called sweet, though sub-acid, and proves good for cooking as well as for dessert. A native of Hubbardston, Mass., it gives most satisfaction

in the North, though it is also reported well in New Mexico, Arizona and Colorado. The fine flavor is impaired by keeping.

APPLE, BEN DAVIS.—Those who minister to the wants or pleasures of mankind are often comparatively unknown. The Ben Davis apple, in many ways, has given pleasure to thousands, and brought dollars to hundreds; but no one knows who Ben Davis was, or

BEN DAVIS APPLE.

where he lived or died. All that is known of its history is that it came into favor with orchard planters, in the southwest, and the name travelled with the tree. In the markets of Philadelphia, there are probably more of this variety offered for sale during December and January than any other. Its ruddy cheeks on a pale yellow ground are tempting, and its eating qualities are by no means poor; yet it could not be classed as specially fine, but as an all-round good variety, it has popular points.

And then it is a good tree for the market-man, in this, that it does not take as many years to come into bearing as some kinds, like the Northern Spy, for instance, and is a regular, yearly bearer,—not requiring the resting spells that some demand,—and seems to be no favorite with apple diseases that feast on other kinds.

Altogether it is a safe variety to plant.

CURRANTS.—Currants, as stoneless grapes are termed, are well-known over the whole world as an article of commerce. The Black Corinth is the popular variety of grape giving us the currants of the Old World,—a grizzly variety, the Sultana, is the kind popular for currant culture in California. The *Alta Advocate*, of Tulare County, gives the following account of the manner of their preparation:—

"The wagons line up to the dump, where the boxes of grapes are emptied into the scalding hot liquor made of steam, water, caustic soda, olive oil, Thorsing, and many other things. From the dip, a galvanized draper dumps the grapes into the rinse of clear water, and from there another draper drops them on to the trays, which are the large prune trays; there a couple of boys spread them and the trays are passed on to a couple of men who load them on fruit cars, which carry the fruit to the sulphur houses, of which there are twenty, and are in charge of Prof. C. E. Horsman. The grapes remain in the sulphur house about three hours, when they are again picked up by the cars and run out to the dry yard. Three or four days are required to properly dry the fruit for the boxes."

CAREFUL GARDENING. — It is often said against amateur gardening, that flowers, fruits and vegetables can be bought in market cheaper than they can be raised. In some respects this is true; but usually the amateur is a long way ahead in the superiority of the articles. This is strongly in evidence by articles found in English markets. Though steam and electricity are pouring the best of their products from favored orchards into England, they are tame compared with that artificially raised by the best English gardeners. In the early part of July, peaches that would ordinarily be pronounced first-class, from Italy and other nature-favored places, brought one shilling and sixpence a dozen. The products of the amateur garden were eagerly sought for at twelve shillings.

PROTECTION FROM FROST.—Though it has been long known, to educated gardeners, that sun on frozen plants had more to do with the destruction of vegetable life than the degree of frost, there has been no attempt to turn this fact to commercial profit. The good gardener,

who finds his greenhouse plants unexpectedly frozen, shades the glass, and syringes with cold water. He knows that it is evaporation that does the injury, and that sunlight aids evaporation.

At length, California orange growers have appreciated the fact. The *California Fruit-grower* tells us that an orange orchard of 17 acres, belonging to the Everest Rancho Co., at Riverside, has been completely covered with lath shading; and though there are only four or five degrees of difference in the temperature between the external atmosphere and that under the lath, the glass has indicated 26° under the shading, without the slightest injury to the orange trees. Another discovery, of great practical importance revealed by this experiment is, that only one-half the water is required during the season. In countries dependent on irrigation, water has to be paid for as in other countries where the cultivator has to pay for manure. Here, the shade during the hot season protects from evaporation. The following is the *Fruit-growers'* account of the method :—

"The posts are of 3 x 4 redwood, 18 feet long. The trees are so planted that the posts are placed 21 feet 3 inches apart each way, setting them 3 feet in the ground, thus allowing about 15 feet in the clear for height of the tree, which is sufficient for most Navel trees. These posts are connected by pieces of 1 x 4 pine suitably braced, on top of which another strip of 1 x 4 has been securely nailed to prevent the whole from swaying sideways with the weight of the cover. This when placed in position is braced horizontally with braces 1 x 3 pine, 7 feet long. Thus is secured a framework that is quite rigid and on which a man may walk freely, providing he has a clear enough head to walk a 4-inch strip.

Over this were stretched galvanized iron wires, diagonally, of No. 11 wire, which are securely stapled on top of each post and to the horizontal braces. These diagonal wires are stretched very tight with iron stretchers and throw a portion of weight of the cover on to the posts directly that would otherwise increase weights on the bents of 1 x 4 pine, 21 feet 3 inches long. These diagonal wires are supplemented by wires running across the framework, at right angles to the direction in which the cover is laid. These four wires—two diagonal and two cross wires—steady the whole construction and distribute the weight more evenly.

Thus is the framework completed. For the cover, they used Arizona lath, being the lightest and best for the purpose, and weaved them on a lath machine into common chicken fencing, placing the lath 1 inch apart and weaving with six wires—three double strands. This is made in sections 21 feet 3 inches long and rolled up preparatory to being taken to cover. In covering the framework, they use four rolls of this lath made of 4-foot lath and one roll of 5-foot lath, thus filling out the space over each tree of 21 feet 3 inches as nearly as necessary. It takes 100 lath to each roll, or 500 to each tree; and as the trees are planted 100 to the acre, 50,000 lath are used to the acre. This Arizona lath is cheaper than ordinary pine in that part of the State."

ENGLISH WALNUTS.—English Walnuts—so-called—are now being extensively raised in America. It is understood that half those consumed are American grown.

SHELLBARKS.—One of the popular nuts in our country, is the Shellbark. This is one of the large number of species of hickory, known botanically as *Carya*. They were formerly noted with the walnuts, or *Juglans*, but were divided from the walnuts under the name as above given by "Nuttall". The chief distinction between the hickory and the walnut, is, that they open their outer nuts or hulls when ripening, while the walnut always maintains the hulls around the nuts until the hulls rot away. There are only two of the hickory that are used as edible. The well known Pecan, which is the olive-shaped nut, and has, therefore, been called *Carya olivæformis*, and the other, the *Carya sulcata*, which is not so often seen in the markets. It is a very much larger nut than the ordinary Shellbark, but unfortunately has a very hard shell, which makes it inconvenient to use. Occasionally some trees are found with comparatively thin shells, and it might be well for those who are on the look-out for improved nuts to place on the market, to watch for some particularly thin varieties of this species to propagate from. But then, one is confronted by difficulties in propagation.

BIOGRAPHY AND LITERATURE.

THE ORIGIN OF FLOWERS.

There were no roses till the first child died,
No violets, no balmy-breath heartsease,
No heliotrope, nor buds so dear to bees,
The honey-hearted woodbine, no gold-eyed
And white-lasht daisy-flower, nor, stretching wide,
Clover and cowslip-cups, like rival seas,
Meeting and parting, as the young spring breeze
Runs giddy races playing seek and hide;
For all flowers died when Eve left Paradise,
And all the world was powerless awhile,
Until a little child was laid in earth.
Then from its grave grew violets for its eyes,
And from its lips rose-petals for its smile,
And so all flowers from that child's death took birth.

MAURICE FRANCIS EGAN,
"Songs and Sonnets."

THE FLORA OF NORTH CAROLINA.—In modern times, geographical botany is one of the most interesting departments of the amiable science,—and local floras have a value unappreciated a generation or so ago. A valuable contribution is before us in the shape of Bulletin No. 164, of the North Carolina Experiment Station, giving a list of the Flora of that State,—a State that is a portion of Paradise, so far as wild flowers enter into the idea. It has been compiled by Mr. C. W. Hyams, and can no doubt be obtained by writing to Mr. W. F. Massey, Horticulturist and Botanist of the Station, at Raleigh. Dr. Curtis, years ago, published a list, but so many additional have been discovered since, that the list is considerably increased. The number of species, from Ranunculus to ferns, is now 2,685.

A commendable feature of the task is that the plant names employed are those in common use. It will take considerable time, and a great issue of popular works, to make the public familiar with the new nomenclature. Comparatively few have the learned treatises at hand, which show the propriety of priority, and a catalogue like this, intended for the masses, covered up under new names, would be "Greek" to them.

JOHN WOOD.—Though not known to American horticulturists generally, the name of Mr. John Wood, of Leeds, England, deserves an honored place. He retired from business after a successful career of twenty-two years, and devoted himself to the culture of flowers, alpine plants being special favorites. He contributed freely of his knowledge to horticultural papers, and the *Garden*, especially, had frequent papers from his pen. He died on the 24th of September, in his 57th year.

LOUIS PRANG.—The Boston papers, while, noting the closing-out sale of Mr. Prang's pictures by the great masters, from which he has made the wonderful lithographic copies that have made his name a household word, all over the world where true art and love of beauty is appreciated, are suggesting high honors for one who has done so much for the pleasure of mankind, and the artistic fame of his adopted country.

Our readers can feel the full force of this in the monthly visit of MEEHANS' MONTHLY, with its Prang colored plate, which is not a mere copy of some great master, merely, but an original picture of nature as well as a faithful reproduction of the picture. If anything equal to these has been given to the world for the price, the publishers are not aware of it. It would not have been possible but for Mr. Prang's work in lithography. His name deserves the honors usually reserved for great warriors or theatrical stars.

THE STRAWBERRY MANUAL,—by Laxton's, Bedford, England. A small bound volume, of 138 pages, replete with information for the lover of strawberries, and the strawberry grower. In the history of strawberry culture, it is interesting to note that the distinction between staminate and pistillate strawberries, and the value of having a few staminates to fertilize the more productive pistillates, did not originate in Cincinnati, as American strawberry history relates, but long before, by Keens,

the raiser of the famous English variety, Keens' Seedling. The claim of the American grower, that strawberry culture is carried on to a greater extent in America than in England, is disputed in these pages. One grower, at Orpington, has 650 acres, all strawberries; while another, near Swanley, has 2,000 acres, "a large proportion" being strawberry. It is a very interesting book, and costs only one shilling.

GENERAL NOTES.

INTELLIGENT CARE OF SMALL CITY PARKS.—At the last meeting of the Council of the Park and Out-door Art Association, Mr. Bryan Lathrop said that he had been greatly impressed, at a recent visit to Washington, with the great injury that was being done to small parks by the removal of all shrubbery on the ground, that it was likely to prove a shelter to evil-disposed persons, this being the idea of the present man in charge of the grounds, who appears to have the power to do this work without restraint. He thought public attention should be called to this, and some provision made for the protection of public parks. He said that many of these parks were designed by Mr. Downing, and his work was, in many cases, just approaching its full beauty and maturity. This made the destruction seem all the more serious.

THE EGYPTIAN LOTUS.—The beautiful *Nelumbium speciosum* is usually distributed by florists as the Sacred Lotus of the Egyptians. But this is a mistake. This is the Chinese Lotus. The Sacred Lotus of the Egyptians was a relative of our Sweet Water Lily, a *Nymphæa*,—*Nymphæa Lotus*. It was held sacred as being the representative of Isis in the annual festival.

FLIES AND THEIR HABITS.—Flies do not require stable manure to deposit their eggs in. Their nesting places are numerous—at the woodpile, amongst the chips, is a favorite resort. This shows one of the advantages of keeping the backyard and the woodpile cleaned up. Any rich, loose, friable soil suits Mrs. Fly in which to deposit her eggs. The best way to keep clear of the flies, in fly-time, is to have wire screens in the windows and doors, and in this way you can keep shut of them, and be happy. Fvery dwelling house in this country uses wire cloth, for screens, to keep both mosquitos and flies out of doors, where they belong.

Festus, Jeff. Co., Missouri. F. K. STEELE.

MADAGASCAR EBONY WOOD TRADE.—"The trade of ebony wood is quite new in Majunka," says *L'Echo de l'élevage*, "because the malgache law prohibited the exportation of wood under the *hova* name.

The first shipment was made in 1894, and it is assured that this rare and precious wood will soon become an extensive traffic.

At the present time it is more particularly carried on in Hamburg. In France, there is little demand for it. The monthly shipment from Majunka is in the neighborhood of twelve tons, at the price of 230 francs per ton; as yet, violet ebony and rose wood, which abounds in that country, is not exported. A commerce of sandal wood and mangrove is carried on by the Indians.—*From La Semaine Horticole, translated by S. D. Lanning.*

THE LARGEST OAK.—An English paper, the *Leed's Mercury*, says:—"Two young oak trees were, on Tuesday last, the 11th inst., planted at Cowthorpe, near Wetherby, to commemorate the celebrated tree, which stands there still, but is greatly decayed, and may not endure much longer. The old tree, as every one knows, girths more than fifty feet, and is in that respect probably the largest oak in the world. The young oaks have been raised from acorns taken from the old tree by Mr. John Clayton, of Bradford, in 1893. The late Mr. Montagu, of Ingmanthorpe, approved of this method of perpetuating the memory of the wonderful tree, and kindly agreed to it before his death. At the ceremony of planting the trees there were present, Mr. Clayton, Messrs. Farrah and Millward, of Harrogate, Mr. Cass, of Cowthorpe, and others.

SOIL OF BERLIN.—According to Mrs. Seliger, the city of Berlin is built on a sandy plain, where not even the heather may grow, so poor naturally is it. In fact, the whole province of the Mark Brandenburg is clear sand, but culture has made it one of the most fertile spots. It has a Botanical Garden of about 25.000 species.

HABENARIA CILIARIS.

YELLOW FRINGED ORCHIS.

NATURAL ORDER, ORCHIDACEÆ.

HABENARIA CILIARIS, R. Brown.—Leaves oblong or lanceolate ; the upper passing into pointed bracts, which are shorter than the ovaries ; spike oblong, rather closely many-flowered ; flowers bright orange yellow, lateral sepal rounded, reflexed ; petals linear, cut-fringed at the apex ; lip oblong, about half the length of the spur, furnished with a very long and copious capillary fringe. Gray's *Manual of Botany of the Northern United States*, Chapman's *Flora of the Southern United States*, Wood's *Class-Book of Botany*, and Britton and Brown's *Illustrated Flora of the Northern United States, Canada, and the British Possessions.*

Dr. Gray remarks that this is the handsomest species in the area covered by his work, and other authors have paid tribute to its beauty. The specimen illustrated was gathered within twenty miles of Philadelphia, but whether on the New Jersey or Pennsylvania side of the Delaware, the notes do not show. It is probably from New Jersey. There are some differences from ordinary forms, as may be seen by comparison with the illustration in "Britton and Brown's Illustrated Flora." The lip is more slender, and more tapering, and the cilia are not of the hair-like character represented in that work. The spurs, also, seem much longer in proportion to the size of the flower ; the bracts are not linear, flaccid, and arranged closely together ; and the undivided root is not round and knobby as there figured, but fusiform as in a carrot or parsnip. These differences do not indicate a serious variation, but are worth noting as illustrating a point seldom given as much weight as it deserves, that we must not expect orchids to be always on one fixed type any more than plants of other families.

The illustration here given is probably one of the most instructive ever placed before the student of our native orchids, by reason of the care taken to present the root system. As the reader generally knows, the original name, *Orchis*, is Greek, and was given to the original representative of the family to signify the twin oval tubers which constituted what was known as the radix or root. One of these is the product of the past, the other of the present year ; but when the latter is perfected, the former is in the initial stage of decay. In the species here illustrated, the twin roots are present, but are separated by a slender cord an inch in length.

We see that at the time when the crown of the fusiform root is about to send up its flower stem, it, at the same time, sends out the connecting thread, and then, perpendicularly into the earth, another thick root similar to itself, bearing, at the crown, the bud which is to be the flower bearer for the next season. From the base of the bud a few fleshy fibres appear, which are to aid in preparing nutrition for storage in advance of the tuber structure for the next season. Another interesting lesson is derived from the facts presented. We may have a plant appear in one spot for many successive years,—but it is not the same plant. In many respects they are annuals,—a wholly new plant replacing the plant of last year, and consequently they are nearly always found scattered ; but the flowers are conspicuous amongst the meadow grasses, and attract the amateur as well as the trained botanist. The occasional dashes of white, as seen along a New Jersey roadside in July or August, are bound to halt the flower-lover.

Up to the beginning of the present century, *Habenaria* would have to be looked for under *Orchis*. Our plant was *Orchis ciliaris*. Our early botanist Clayton, in the days when plants had but one name, sent it to Gronovius, from Virginia, as the "Orchis with an undivided bulb, the lip lanceolate-ciliate, and with a very long horn." He speaks also of a white variety.

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The number of species was very large; but no one knew how to divide them into separate genera. Willdenow, who prepared a *Species Plantarum*, in 1805, found nearly a hundred of them, and separated our present genus, *Habenaria*, from it. But he could only make two species for his newly established genus,—*Habenaria macroceratilis*, and *H. brachyceratilis*, the long-horned and the short-horned, both West Indian species. To-day, according to "Durand's Index," there are 450 species of this genus described. In this, however, he has ten sections, in which *Platanthera* and *Gymnadenia*, which many of our botanists regard as full genera, have a place.

It was not till after vegetable morphology became better understood, that Robert Brown was able to divide the great family of *Orchis* into various genera, and which have stood well the test of time. He was attached to Flander's exploring expedition, and seems to have left his manuscripts with the authors of *Hortus Kewensis*. He removed our species to Willdenow's genus, *Habenaria*, and his MSS. is quoted there as authority. Thus, in 1813, it appears for the first time as *Habenaria ciliaris*.

Robert Brown, as a botanist, was a remarkable man. His intimate knowledge, of vegetable anatomy and morphology, gave him a great advantage in systematic botany, which his compeers did not possess. These branches were not as assiduously pursued in England as they were on the continent of Europe, and thus he was better appreciated there than in his own land. He was born at Montrose, in Scotland, in 1773, and when only in his 28th year, was appointed botanist to the expedition sent to explore Australia under the command of Captain Flinders. The expedition returned in 1805. So active was Brown, in his department, that he brought back with him over 4,000 species of Australian plants. His botanical appendix, to Flinder's narrative of his voyage, was regarded as a marvel in the state of the science at that time. He died in London, in 1858. His initials, R. Br., as the author of species after a plant's name, is of the most frequent occurrence.

Orchis, as a family name for these plants, reaches far into antiquity. The name itself, as already noted, has reference to the twin roots of many species; but orchis itself, or himself, has a place in Grecian mythology. He was the son of a rural god; but, at one of the festivals of Bacchus, he drank enough wine to lead him to so far forget himself as to offer an insult to one of the priestesses, whereon he was slain by the Baccharites for his insolence. Being of godly birth, however, these mighty personages had to do something to honor his memory, and the *Orchis* was raised up to perpetuate his name and family history.

In the Old World, the wild species of the family have been divided by the people into various sections, according to their resemblances. In England, they have the Man Orchis, the Bee Orchis, the Fly Orchis, and others. Our plant would be classed as a Butterfly Orchis, that being the designation there of *Habenaria bifolia*. In our country, these nice discriminations have not yet been made. Indeed, the author knows of nothing in the line of sentiment that has been applied to our beautiful plant. Perhaps they have their own little world among themselves,—their stage, and their own actors, and we may say with Walter Savage Landor:

"Flowers bring me tales of growth and tones of love,
And 'tis, and ever was, my wish and way
To let all flowers live freely, and all die
When'er their genus bids their souls depart
Among their kindred in their native place."

The Chinese are fond of naming their honorable societies and associations after flowers. They have one denominated "The Golden Orchis;" but what species they have in mind, or the nature of the body it represents, is not known to the author.

Habenaria ciliaris is pretty well distributed along the Eastern Atlantic portion of our territory, from Canada to Florida, and west to Eastern Texas. Extending over so wide a territory, it is in flower in various sections from June till August. It is said to bear cultivation better than some orchids, and has been in English gardens since 1796. It continues in flower there longer than in its native places. Robinson says, in his "English Flower Garden," "*Habenaria ciliaris* is the handsomest species of the genus. The flowers are bright orange yellow, with a conspicuous fringe upon them, and are produced from July to September."

EXPLANATION OF THE PLATE.—1. A whole plant in three sections. 2. The root system of the present year. 3. The root system of the forth-coming year.

WILD FLOWERS AND NATURE.

FLEETING BEAUTY.

Spirit of Beauty, that doth consecrate
With thine own hues all thou dost shine upon
Of human thought or form, where art thou gone?
Thy light alone, like mists o'er mountains driven,
Or music by the night wind sent
Through strings of some still instrument,
Or moonlight on a midnight stream,
Gives grace and truth to life's unquiet dream.

SHELLEY.

THE WHITE OAK, QUERCUS ALBA.—A White Oak tree was cut in Knox County, Indiana, in January, that is supposed to have been one of the largest of the kind ever cut in that section. It measured eight feet four inches at the butt, fifty-three inches at the small end, scaled 7,867 feet, and made four twelve-feet logs. The tree was cut and rolled to White River and loaded on a barge, taken to Mt. Carmel, Ill., rolled to side track and loaded two logs to a car. A silver dollar would have covered the heart of any one of the logs. The tree was bought by John S. Dickson, timber buyer for A. B. Mickey & Sons, Princeton. The logs will cut quartered oak panels, 27 to 28 inches wide.—*The Forester*.

THE NAME BUTTERFLY-WEED. — Though not a native of this locality, we were fortunate in having a plant of this handsome milkweed among our perennials for a number of years, and I often wondered why it was so called. Not until crossing the Indiana prairies, on a July day, when the fencerows were lined with this plant in its glory, did the appropriateness of the popular name appear; for, as seen from the window of the fast-moving train, the plants constantly reminded me of hosts of golden-brown butterflies. BESSIE L. PUTNAM.

SPANISH MOSS.—I have repeatedly observed the fruiting of *Tillandsia usneoides*, (Spanish Moss) in Florida, Louisiana, etc. The flower is about the size of a gun cap and slightly tubular and greenish in color. The seed pod is nearly an inch long, the size of a knitting needle and of a brown color. The seeds, by means of their downy attachments, float in the air and catch and grow almost anywhere above ground.

I could never see any signs of the plants, either large or small, feeding as parasites do, but only as epiphites, from the air and rain. In the spring of 1885, I took specimens from Louisiana to Kansas, and hung them in the trees on my lawn, where they grew and fruited well; but the cold killed all in the fall. I believe this plant would grow on a clothesline, if in the right climate.

Parksley, Va. H. E. VAN DEMAN.

The writer has seen plants in Louisiana that had evidently been a long while on telephone wires, blown there by the winds, and growing somewhat, but not luxuriantly. And plants brought to the north from Florida, will live for a year or two suspended in greenhouses; but they eventually dwindle away. Though, as Mr. Van Deman well says, they are not parasites, it seems possible that the plant derives some benefit from the attachments.

SAP-SUGAR.—A suburban resident of Philadelphia, an eminent chemist, sends the following biological question, under date of December 20th:—

"A telephone rigger, employed by a monopolistic concern, fastened a number of wires on to a large branch of a stately Sugar Maple in front of my premises,—*of course*, without asking my permission. Repeated climbing up and down the trunk, assisted by spurs, he punctured deeply into bark and wood. Two days after the sap commenced to flow out of some seventy wounds. Freezing, it formed long streaks of ice down along the trunk. Tasting this ice, I find no presence of sugar. This fact appearing to me strange and interesting, I venture to ask you, whether there is no sugar developed at low temperature, during

the winter; or whether—if formed—it is retained within the cells, while the water exudes."

In freezing, whatever is held in solution is pushed outwardly. Only the pure water freezes. A beautiful experiment may be made with a bottle of ink. If exposed to a temperature wherein the whole contents of the bottle can be frozen solid, the ice will be as clear as crystal, and the inky matter separated by itself in a small cavity in the centre. The writer has had a similar statement from cider-makers, that if a barrel be frozen, the liquid is but water, while pure alcohol collects in the middle of the barrel. The sugar in the sap would therefore be on the surface of the icicle, and drain off when a thaw came, leaving but pure water in the icicle.

THE WILD CHINA ASTER.—This wild form of our beautiful China Aster does not appear to have been in cultivation till recently. The *Botanical Magazine* figures it, and says:—

"The indigenous form of the 'China Aster' appears to be common in the rocky hills of northern China, in eastern Turkestan, western Thibet, and Afghanistan. The plant figured was raised from seeds supplied by Messrs. Vilmorin, Andrieux & Cie., which were obtained from the Abbé Farges, who collected them in Sechuan. The heads are solitary, ray-florets numerous, linear, violet-blue; disc-florets numerous, of a golden yellow color."

CUT-LEAVED BUCKEYE.—Plants sent for name are frequent on the office tables. Opening a letter from Mr. W. C. Egan, with a specimen, the mental comment was "a form of *Pteris tremula*." The letter explained that the specimen was from a dozen found on a second growth of Buckeye in Kentucky. The venation testified to its being a genuine Buckeye, for all its comb-like leaflets. Just why these things should be, is still a question unsolved; but they cannot be accounted for by the popular explanation of "environment."

PENETRATING POWER OF THE LOWER ORGANISMS.—In recent times there has been much interest taken in filters for purifying drinking-water. In Philadelphia during the past year, this was especially the case, and the City Councils of that city made an appropriation of $35,000 for "germ-proof" filters for the public schools. Some of these were dependent on tubes made of diatomic clay, through which the water could percolate with such difficulty, that only a small supply could get through in an hour. Some of these that had been in use a year were tested, and it was found that the mycelium of some fungus had, in some instances, penetrated wholly through the tube. It did not follow that this fungus was deleterious; but whether or not, it was clear there was no such thing as a germ-proof filter.

Indeed, the fact has long been known to observing students of nature that many species of the lower orders of vegetation excrete an acid that enables them to penetrate the hardest rock. It is well-known that by this power rocks are dissolved, and soil prepared for the more complex forms of vegetation,—and that, by this power of acid secretion, bones or even tough minerals are dissolved for their nutrition. Indeed, it is now understood that in the case of the few bacteria that are known to be a serious menace to human life, such as those in connection with cholera, typhoid fever, yellow fever, and so on, their noxious character is solely due to the nitric acid they produce during their rapid growth in the human system.

ANGELICA HIRSUTA.—Mr. Ed. Reagan writes pleasantly of the above plant. It is my custom to read over all the articles which are so delightfully portrayed by the conductors of the MONTHLY, then afterwards study out the botanical names, using Dr. Gray's Manual. I do this to familiarize myself with the names and their descriptions.

Looking over Dr. Gray's Manual, I find that *Angelica Curtisii* is described "Calyx-teeth obsolete." Looking further, to the next page, I see *Archangelica hirsuta*, "Calyx-teeth short."

Dr. Gray says "that the species have been separated with hardly sufficient reason."

Festus, Mo. F. K. STEELE.

YELLOW BIRCH IN NORTH CAROLINA.—A correspondent finds the Yellow Birch, *Betula lutea*, at Blowing Rock, North Carolina,—far south of its usual limit.

GENERAL GARDENING.

THE LITTLE GARDEN.

"No plot so narrow, be but Nature there;
No waste so vacant, but may well employ
Each faculty of sense, and keep the heart
Awake to love and beauty."

WORDSWORTH.

TRANSPLANTING RHODODENDRONS IN SPRING.—Although blooming comparatively early in the spring, the blossoming of rhododendrons and azaleas is not disturbed by late spring planting, the plants usually being lifted with compact balls of earth. Most persons prefer planting them out at that time, as if carefully planted, they will take hold of the soil at once.

PARKS AND CHILDREN'S PLAY-GROUNDS.—"The subject of play-grounds for children and youth has been busily discussed in the last few years. The sports of youth are admirable deterrents from vice and excellent means of educating both body and mind. As a mere source of happiness they are worth much. While the main burden of providing the grounds and apparatus for play will fall on school authorities, a part of it will rest on those in charge of park systems."

"A zoological garden is a great ornament to a city, and a most admirable adjunct to school education. The child who can see and study a moose, an eagle, an alligator, or any other strange beast of the field, gets what no book can ever teach."

The foregoing remarks, extracts from an annual address by the President of the Minneapolis Board of Park Commissioners, contain food for thought, and serve to show that the purposes of parks are being broadened as they should be.

Parks are, or should be, designed for the rest and recreation of old and young alike; yet how constrained do some of them appear, confronting us everywhere with "Keep-off-the Grass" signs.

In some few cities, the question, or rather its answer, has assumed more definite shape. Boston is foremost, with play-grounds including out-door gymnastic apparatus. Philadelphia's Fairmount Park has a large area given up entirely to base-ball and tennis fields, with another particular portion for smaller folk, known as the Children's Play-ground. Many of the public school-yards are also thrown open in vacation time for the enjoyment of the children in the heart of the city. Some other cities give opportunity for bathing in summer and skating in winter. All provisions of this nature have a tendency to increase in our young people a spirit of happiness and contentedness with their respective places in life, and the making of better citizens.

TREATMENT OF SHIPMENTS OF PLANTS THAT ARE FROZEN.—It not infrequently occurs that plants shipped late in the fall or during the winter season, in mild weather, are caught en route by severe weather and become frozen. Many persons would think them perhaps fatally injured and of little value; but they should consider them as in about the same condition as any other plants which may be planted out and are subject to just as great frost. Exposure to frost is not harmful provided the plants may thaw gradually, unexposed to light and heat. The best plan, therefore, is to let the box remain unopened, and put it in a cool cellar. It may take a week or more to thaw out; but under proper conditions there will be no harm done.

LIQUIDAMBAR STYRACIFLUA AS A PARK TREE.—The home of Liquidambar styraciflua is in the Southern States of North America. The tree, while young, requires protection from wind-blasts. The most hardy variety is *Liquidambar styraciflua Mexicana*. This noble tree, with leaves resembling those of the maple, appears at its best advantage as a single tree on a lawn. Beginning in August, the nerves of the leaves, and gradually the whole of the leaves, assume bright purple coloring. The Amber Tree belongs to the witch-hazel family

(*Hamamelideæ*), and grows readily in any nourished and humid soil."

The above item, regarding what, in America, is commonly known as Sweet Gum, translated from an article by Mr. Krause, of Leipsic, Thonberg, in Muller's *Gartner Zeitung*, may serve to bring more to American notice a beautiful, but somewhat neglected tree.

Just why *Mexicana* is added, is not clear, as, though the tree is found in the mountains of Mexico, that is but the southern boundary of the same plant. The ball-like mass of seed vessels are somewhat smaller, in Mexican specimens to hand, than in more northern specimens. But the plants are extremely liable to vary among themselves, individually, even in its most northern lines, which may be considered about the latitude of New York. Cultivated trees, in the vicinity of Philadelphia, have some with the leaves so nearly entire, that the usual star-like outline is scarcely apparent. In other cases, the large leaves are so deeply lobed, that a narrow margin of green is about all that is left to the five strong veins. Some trees grow as upright as a poplar, while others may spread as an apple tree. But they are all beauties, in whatever condition presented.

A SIGN OVERGROWN BY WOOD OF TREE.

ATTACHING NAMES OR SIGNS TO TREES.—Mr. E. H. Griffin, of Gloucester, Mass., furnishes, at the kind suggestion of Mr. Duncan Aird, a photograph of a tree, that had had an iron label attached to it. The label was attached to the tree in 1855, when the trees were not very large. The labels were about two feet long, attached to the tree by iron hooks, and projected about four feet beyond the width of the trees. They were hung loosely in order to give the trees a chance to grow.

As seen in the illustration, the ornamental curvings of the sign boards are still visible; but the new growth of wood and bark has almost covered and enclosed the board. The curious part of the phenomena to the general observer is, why there seems to have been no pressure in the wood growth, to force away, or distort the board?

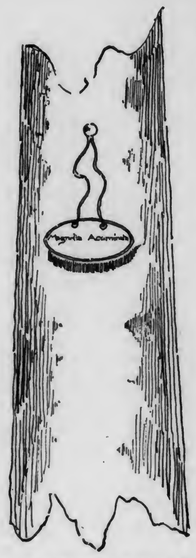
To those who understand the manner in which new wood forms, the explanation is simple. The increase in the girth of trees takes place during a few weeks at mid-summer, and is by the rapid multiplication of minute cells. These, at first, are as soft as mush, and might be compared to the flow of so much yeast. If the flow is checked in one direction, it turns to the direction its neighbor is journeying, and adds itself to the volume of that stream. The extra thickness of the margins in the illustration is, therefore, due to the addition of that which, but for the board pressure, would have been deposited beneath.

There is only one way by which tree labels, or any attachment can be made to a living tree that will not provoke serious resistance from the new annual layer of wood cells, and that is by allowing a length of wire, which is to be permitted to grow into the tree with the increase in its annual girth. The illustration explains this so clearly that further description is unnecessary.

LAWN-MAKING.—One of the greatest problems in general gardening is the production of a good turf and maintaining it. Yet it is easy to solve, too, if carefully attended to.

The chief thing is to start right. There should be a good, rich, loamy top-soil, six inches in depth, at least, in which the seed should be sown. Unless for some very good reason, which would seldom be the case, one kind of grass only should be sown, which will make an even, regular growth —if cared for. Dishonest contractors are occasionally to be met with who do not hesitate to "skimp" with the top-soil, and a weak, stunted and tufted growth of grass is the result.

Kentucky Blue-grass is the most popular and best for more northern States, being very hardy and close-growing. It is a famous pasture grass, and thrives in almost all soils. For excessively dry soils, where it has been found difficult to establish ordinary grass, Sheep Fescue, a very fine, "silky" grass, will be found admirable. Around the base of large trees, where it is not also shady, it will grow right up to their trunks. This is also recommended for sowing in sod which is troubled with annual grass or weeds, as it may be cut very close, and the annuals prevented from seeding. While telling what to do, it is well to add what to avoid. Whatever kind of grass is employed to seed with, it should be of a slightly creeping, and not of a tufty character. It is impossible to make a close, even carpet with a tufty grass.



A GOOD METHOD OF ATTACHING LABELS.

ENCOURAGEMENT TO PLANTING AROUND MANUFACTORIES.—It has been decided, by the American Park and Outdoor Art Association, to take into consideration the matter of offering prizes, in our different cities, for the improvement of grounds about manufactories and homes—both front and rear lots—and especially about the homes of artisans. If an effort of this kind will succeed in creating a greater love for attractive home surroundings among the class of working people, the Association will have accomplished something to be proud of. The National Cash Register Co., have set a practical example of what can be done in this respect, so the movement has foundation for hopes of success.

AMERICAN FORESTS.—For all the prophecies of a century ago, that the lumber supply would be exhausted in a few years, the forests seem still inexhaustible. The prophets did not know America. Mr. Frederick Weyerhauser, of Chippewa Falls, has recently purchased, for $6.00 an acre, 1,000,000 acres of standing timber on the line of the Northern Pacific. It is not every one that could pay out six millions of dollars, nor many countries that could have a million acres to sell, with millions more of acres to sell.

SHINY WILLOW.—Miss Graceanna Lewis, of Media, Pennsylvania, sends specimens of a willow from a tree on Marshall Painter's grounds, three and a half miles from Media, that she thinks must be distinct from the shiny, or glossy-leaved willow, *Salix lucida*. One is about 50 feet high, with branches somewhat spreading; the other very tall growing, and estimated at 70 or 80 feet high. There seems to be no difference, in the leaves and branches of the latter tree sent for inspection, from *Salix lucida;* but the trees are certainly remarkable as belonging to a species of which 20 feet high is the recorded maximum.

DISTRIBUTION OF BOTANIC GARDENS.—Well-organized Botanic Gardens may be very valuable to their respective sections of the country where plants are used extensively; some are simply public parks, having what were once rare trees, but now just "fine specimens." These latter gardens are not kept up to date in modern introductions, and simply give the

(*Hamamelideæ*), and grows readily in any nourished and humid soil."

The above item, regarding what, in America, is commonly known as Sweet Gum, translated from an article by Mr. Krause, of Leipsic, Thonberg, in Muller's *Gartner Zeitung*, may serve to bring more to American notice a beautiful, but somewhat neglected tree.

Just why *Mexicana* is added, is not clear, as, though the tree is found in the mountains of Mexico, that is but the southern boundary of the same plant. The ball-like mass of seed vessels are somewhat smaller, in Mexican specimens to hand, than in more northern specimens. But the plants are extremely liable to vary among themselves, individually, even in its most northern lines, which may be considered about the latitude of New York. Cultivated trees, in the vicinity of Philadelphia, have some with the leaves so nearly entire, that the usual star-like outline is scarcely apparent. In other cases, the large leaves are so deeply lobed, that a narrow margin of green is about all that is left to the five strong veins. Some trees grow as upright as a poplar, while others may spread as an apple tree. But they are all beauties, in whatever condition presented.

A SIGN OVERGROWN BY WOOD OF TREE.

ATTACHING NAMES OR SIGNS TO TREES.—Mr. E. H. Griffin, of Gloucester, Mass., furnishes, at the kind suggestion of Mr. Duncan Aird, a photograph of a tree, that had had an iron label attached to it. The label was attached to the tree in 1855, when the trees were not very large. The labels were about two feet long, attached to the tree by iron hooks, and projected about four feet beyond the width of the trees. They were hung loosely in order to give the trees a chance to grow.

As seen in the illustration, the ornamental curvings of the sign boards are still visible; but the new growth of wood and bark has almost covered and enclosed the board. The curious part of the phenomena to the general observer is, why there seems to have been no pressure in the wood growth, to force away, or distort the board?

To those who understand the manner in which new wood forms, the explanation is simple. The increase in the girth of trees takes place during a few weeks at mid-summer, and is by the rapid multiplication of minute cells. These, at first, are as soft as mush, and might be compared to the flow of so much yeast. If the flow is checked in one direction, it turns to the direction its neighbor is journeying, and adds itself to the volume of that stream. The extra thickness of the margins in the illustration is, therefore, due to the addition of that which, but for the board pressure, would have been deposited beneath.

There is only one way by which tree labels, or any attachment can be made to a living tree that will not provoke serious resistance from the new annual layer of wood cells, and that is by allowing a length of wire, which is to be permitted to grow into the tree with the increase in its annual girth. The illustration explains this so clearly that further description is unnecessary.

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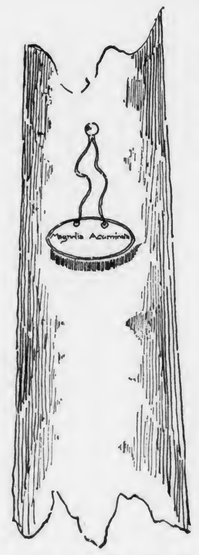

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INTENTIONAL SECOND EXPOSURE

city or State the distinction of possessing a Botanic Garden.

Boston is conceded to have the most progressive Botanic Garden, known as the Arnold Arboretum. St. Louis has one among the best. There are others at Buffalo, N. Y. ; Washington, D. C.; Philadelphia, Pa.; New York City, N. Y. ; Northampton, Mass. ; San Francisco, Cal.

Then there are quite a number of nurseries and private places containing such large collections as to entitle them to rank with the more public ones. Fairmount Park and Laurel Hill Cemetery, Philadelphia, were once foremost with collections of rare trees, magnificent specimens of which are now standing. The latter was especially noted for its collection in the time of Downing.

MULGEDIUM FOR FODDER. — Most of our readers know the wild Giant Lettuce, *Mulgedium leucophaeum*, which grows some eight or ten feet high, with a stem an inch or two thick, and clothed with foliage to the top. This has yellowish flowers. There is another smaller species, *Mulgedium acuminatum*, with a somewhat purplish stem and flowers, growing about six or eight feet in height. A correspondent from Westmoreland County, Pennsylvania, writes that horses seem greedily fond of it, and it might be worth while to get it into a regular agricultural crop. For such a purpose, it would have to be brought into comparison with other crops used simply for fodder—corn, for instance. Here it certainly would have the advantage of starting into growth early. It would not need hot sun for rapid growth. It is well worth considering. But as green fodder is chiefly for cows, the effect on the milk would have to be considered.

PAVING MATERIALS.—Where there is constant heavy traffic, macadam roads are costly to keep in thorough repair ; and unless well kept, are muddy or dusty. Blocks of hard stone chip at the edges,—the rounded block produces enormous noise from wheels jumping over them from one to another. Sheet asphalt is slippery in wet weather, and very costly to keep in repair,—indeed, in large cities the first cost is repeated every five years. Vitrified bricks are largely used in Philadelphia, where toughness is considered instead of brittle hardness, and, set close together with bevelled edges, they wear well under considerable traffic. Australian Gum blocks make a durable and noiseless pavement, but must be kept sanded to avoid slipping.

Experiments are being made with a new paving material composed of bitumen, cork, and certain other materials, subjected to a pressure of about 600 pounds to the inch. In addition to being non-slippery, noiseless, and non-absorbent, the new material requires no gravel sprinkling.

REINWARDTIA TRYGINUM.—The little East Indian *Reinwardtia tryginum*, or *Linum tryginum*, as many know it, is a pretty green-house plant worthy of more general cultivation. It bears yellow flowers about the size of a *Tropæolum* flower, but, of course, without the spur of the latter. Though a shrubby perennial, it is thought to succeed best treated as a biennial and raised annually by means of cuttings.

CULTURE OF AQUATICS.—The attention paid in America to the culture of Water Lilies and other aquatics, is stimulating the flower-lovers of the Old World to similar good works. References to American experiences in this direction, are among the frequent papers in European periodicals. Illustrations of scenes in Dreer's garden appear in the German papers. With Mr. Moulder's practical articles on Water Lily culture, and Mr. Dreer's good examples of what can be done, the good work is going on. The Victoria Lily, in the open air, is the great wonder.

NEW OR RARE PLANTS.

ACORUS GRAMINEUS VARIEGATUS.—The Sweet-flag, *Acorus Calamus*, most particularly the variegated-leaved form, is very generally known, and has been in use, though perhaps not cultivated for ornament, since ancient times. Doubtless the Sweet Calamus, mentioned in the Book of Exodus, is identical with it. There is a genus of palms by name of *Calamus*, but of course unrelated to our reed, the Sweet-flag. The root of the *Acorus* when dried or bruised emits a pleasant, aromatic odor, and is said to have been used, by the ancients, mixed with rushes and strewn on the floors of their homes and in places for religious worship. The name *Acorus* comes from Greek derivatives showing it to have been utilized medicinally, for maladies of the eye. In more modern times, its value has been extended, being used in confectionary ; for hair powders and perfumery ; and for flavoring intoxicating liquors. With the origin and cultivation of the variegated form, it has been brought into more general use in gardening, where something for damp and marshy ground is desired, in which place it is at home.

All this, concerning the species *Calamus*, furnishes greater interest in another species, (there are but three decided species), *gramineus*, which has also a variegated form. But while *Calamus* grows vigorously to an approximate height of three feet, *gramineus* is barely more than nine inches, and grass-like, forming very pretty little tufts. The writer has never seen it grown outside of a greenhouse ; but there is good reason to believe it might prove hardy.

CHINESE SPICE-BUSH. — Most of our readers are acquainted with that gem of our old-fashioned gardens, the "Sweet Shrub," *Calycanthus floridus*. Old Father Linnæus gave us another species, which he called *Calycanthus fragrans*. It is a native of Japan, and is most delightfully scented. Nomenclatural iconoclasts have, however, torn it from its association with its sweet American sister, and it now goes as *Chimonanthus fragrans*.

CHIMONANTHUS FRAGRANS.

To us, common flower lovers, it is better known as Chinese Spice-bush. Though the plant is perfectly hardy in the Atlantic portion of our country, it will send forth its blossoms under the first warm winter's sun, only to have them killed by the next day's cruel frost.

The knowing ones, however, cut the twigs before the buds open, and place them in water in a warm room, when they seem to open as contentedly as if on the bush in the open air. They fill the air with fragrance for a whole week after opening. On this account, it is a very welcome addition to the amateur's garden.

CAMPHOR AND TALLOW TREES IN NEW ORLEANS.—In regards to note in a recent issue, the camphor as a street tree in New Orleans, I feel sure that both Mr. Smith and yourselves will regret to learn that very few survived the severity of last winter. This is much to be regretted, as it gave promise, at one time, of being one of the most beautiful of evergreen trees for this climate. It was particularly attractive in the spring, when making its new growth. The young shoots and leaves might be described as rose colored, and appeared, from a distance, like a large tree in bloom. Another tree, which served the same fate, was the *Stillingia sebifera* (The Tallow Tree of China). This was one of the most common street trees here, and although it had very few claims to beauty, it was a tree that could stand a great deal of abuse. It was a very common thing to see it growing on the sidewalk, paved as close to its trunk as it could possibly be and flourishing like, I think, no other tree would flourish under such conditions. In a few years, however, this is liable to be as common as ever, as large quantities of seedlings are coming up wherever the old trees grew. GEO. THOMAS.

New Orleans.

There is a species indigenous in the Southern States, *S. sylvatica*, commonly called Queen's Root. But it is simply a perennial herb, the root of which, it is said, furnishes a lotion soothing to certain skin diseases. Stillingias are members of the Spurge family, *Euphorbiaceæ*.

THE HARDY FLOWER GARDEN.

PÆONIA TENUIFOLIA FL. PL.—Unless familiar with it, most persons would pass the Fennel-leaved Pæony, *P. tenuifolia*, without classing it among pæonies, so distinct in appearance is the finely-divided foliage. Then, too, being of dwarf growth, its habit is not quite the same. There are no branches to speak of, the medium size flowers terminating each stem which arises direct from the ground. It is the earliest pæony to bloom, and the bright scarlet flowers

show to great advantage against the green, fringe-like foliage. Contrary to the habit of the other pæonies, this one never makes a very large clump, and, therefore, does not occupy much space. Plants dotted around here and there in the fore-ground of shrubbery beds and herbaceous borders liven them up wonderfully. The illustration accompanying gives an idea of the very fine foliage; but the plant in flower should be seen to be fully appreciated. It makes a very suitable plant for forcing.

PRUNING ROSES.—The London *Gardening Illustrated* gives excellent advice for pruning roses, that is as applicable to the New World as found useful in the Old.

"The Polyantha Roses, where employed for edging, should be pruned hard. They may be cut down nearly to the ground. If wanted as bushes, then treat them similar to the Teas, pruning the weakly growers severely, and the more vigorous slightly.

PÆONIA TENUIFOLIA FL. PL.

Rugosa or Japanese Roses merely require the extreme ends of the shoots trimmed off, but the centres should be well thinned.

Moss and Cabbage Roses, Damask, and Maiden's Blush tribe, Gallicas, and Hybrid Chinese should be very sparsely pruned if large bushes are desired. As these are the least excitable tribes they should be the first to be operated upon. Here, again, I would advise the reduction of the number of shoots, but the strong young growths retained leave from six inches to nine inches long, according to the vigor of the variety. When large bushes are wanted, the first year leave the growths long—say, from three feet to four feet—then they may be subsequently pruned as directed. I have seen Moss-bushes about seven feet high, and their branches indicate that they were originally left about four feet long. These branches are now thick stems, the new growths arising from the shoots above them. The old spent-out wood must be removed in order to keep up the rejuvenating process of new shoots, but so long as this old wood remains healthy it will be as well to retain it, if size of plant is sought after. Many of these roses make fine pillars, and their treatment would then vary from that advocated here, but I shall notice this later on.

The Penzance Briers, together with the many lovely single roses, require to be left practically unpruned, not even removing the extreme ends. Their natural, graceful habit is then maintained; indeed, here we may derive a lesson from the wildings of Nature, and endeavor to preserve those elegant arch-like shoots that are so beautiful when wreathed in blossom. Such rambling roses as the Ayrshire and Sempervirens, the Crimson Rambler, etc., require merely the removal of old growths as they show signs of debility. Of course, when very crowded, even if healthy, remove some growths entirely if space be not available to spread them out.

The Austrian Briers, which include the lovely *R. punicea* or Austrian Copper, should have the merest tipping of the shoots; but to preserve vigor in these kinds have a double set of plants, so that they may be cut down in alternate years.

Scotch Roses should not be pruned at all, beyond removing dead wood. If they outgrow their boundary they may be cut back hard now and then.

Climbing Teas and Noisettes on walls should have some of the old growths that have flowered cut out in July. Then in the spring all that is needful is to lay in the young ripened shoots and cut back the laterals upon the ripened growths retained, removing entirely any soft, sappy wood. It is always advisable, where possible, to somewhat spread out the new growths when laying them in. This gives a check to the sap and acts in a similar manner to the pegging-down of the Hybrid Perpetuals. Some even go so far as to lay these young shoots down until buds have started, then blooms may be had from nearly every eye. Climbing Roses planted last autumn should be cut back quite one-half their length this spring. Indeed, in many cases it is best to cut down the shoots to two or three eyes, the result being long growths that should flower abundantly the following summer. In well-sheltered districts where Maréchal Niel is grown upon south walls outdoors, the shoots that yield blossoms should be cut away in July. If the season be a good one, some fine young canes are produced that provide glorious blossoms the next year. When this rose is grown as a standard, it is best trained as a weeper upon an umbrella-shaped frame of wire. The bending down induces the growths to flower, and such trees increase in beauty each succeeding year if kept in a healthy state by training in plenty of new wood and cutting away the old growths. Gloire de Dijon, Mme. Berard, and other Tea Roses grown as standards make glorious heads, and should be very moderately pruned, always keeping in mind the desirability of having hard, sound wood, and removing that soft and worn out. Many amateurs unacquainted with roses often find that they have planted what is known as a climbing rose amongst their dwarf plants. Supposing such plants cannot be pegged down, do not cut away the long growths, but train them around three stakes placed at a suitable distance apart and the points brought together at the top. Such growths will flower from nearly every eye if thus trained. This is a capital way of growing many of the superb yellow climbing roses where wall space is limited. Directly flowers have fallen remove the old growths and let the young shoots grow as they like, until the next season."

FRUITS AND VEGETABLES.

BLACKBERRIES IN AUSTRALIA.—In parts of New South Wales, the blackberry is so prolific that the fruit is gathered by the ton, in place of the bushel or hundredweight with which English blackberry gatherers are familiar.

The blackberry is finest and most abundant on the coast a few miles south of Sydney; and Bulli, one of the leading coastal townships, inhabited chiefly by miners employed in the neighboring collieries, is rapidly becoming a centre for the annual export of many tons of the delicious fruit. Rising gradually from the coast are the extensive Illawarra Mountain ranges, and in not a few places on the slopes of these, on the lofty summits, and in clearings, the blackberry bushes occupy many acres of ground. Paddocks which have been cleared and fenced, for cultivation or pasturage, offer no bar to the advance of the brambles. In more than one instance, owners of land have long since ceased to fight the growth, which even bush fires but temporarily retard, so find it more congenial to lease their holdings for a small rental to the pickers, who, as a rule, have anything but an easy time of it. The bushes grow in a most irregular way, presenting in most cases a compact mass of thorn and briar many yards deep and several feet high. To reach every part of this mass of entanglement is the blackberry picker's aim. Yet he succeeds in doing so, and may spend a day in one spot, forcing his way through the bushes as best he can. Generally, he will cut a narrow track to the heart of the bushes, and, establishing a centre at that point, "work" the bushes cleanly and systematically. Billies, buckets, and tins receive the fruit, which may then have to be carried some distance, perhaps right into the township, before being disposed of. Most of the blackberry pickers are coal-miners, and they have the assistance of their wives and families.—London *Journal of Horticulture.*

INDIAN FIG CACTUS.—A large-fruited species of *Opuntia* has long been known as Indian Fig, on account of the edible character of its fruits. It was described by Miller as *Opuntia Ficus-Indica*, as a distinct species, though now regarded as a form of *Opuntia Tuna*, supposed by the same author to be a distinct species. Like other kinds of plants, variations may be selected with superior characters,—and a very large fruited and productive variety has been raised in northern Africa, and introduced into California, by Prof. Emory E. Smith, of Leland Stanford University. A sketch of a group, with Professor Smith standing among them to show the height of the plants, is herewith given. They are called Nopaleas by the Algerians, and this name is adopted by Prof. Smith. The fruit is of the size of a very large fig, and the flavor should be that of a well ripened gooseberry, a family to which the gooseberry is closely allied.

Mr. Smith says of it:—

"Several years ago, while traveling in Southern Europe and Northern Africa, my at-

tention was attracted by the very large and delicious cactus fruits which abounded on the fruit stands and were peddled on the streets of the towns. Conceiving that this might prove a valuable addition to California's already long list of fruits, I collected some of the best varieties obtainable. These were forwarded to the gardens of Timothy Hopkins, at Menlo Park, where they were cared for until ready for setting out.

The plants have grown equally well in the several parts of the State to which they were sent. Last year they fruited lightly, but the present season some of them have borne such immense crops that the branches have been broken under the weight. The fruits vary in color from bright carmine to yellowish orange; they are pear-shaped, oblong or nearly round according to variety. Some of them measure five inches in length, eight inches in circumference and weigh full eight ounces. They should always be allowed to ripen thoroughly, picked in the early morning and kept in the shade, as they are slightly insipid when warm. The fruits of the red varieties are most gorgeously colored when peeled.

INDIAN FIG CACTUS.

The Spaniard, Sicilian or Arab, who, from necessity or taste, makes a habit of dining on cactus fruit, carries a small piece of leather with a strap over the back, under which his fingers can be slipped. With this leather he grasps the fruit, the ends are slashed off with a sharp knife and a pronged stick or fork securely stuck into the side. The fruit is now held erect, a lengthwise cut made in the skin, which is turned back both ways, exposing the ruby or golden heart, as the case may be. In a twinkling this disappears down his throat in much the same fashion as a raw oyster is swallowed. This deft operation is repeated eight or ten times, when the curbstone diner saunters off with a Chesterfieldian air, 'nothing can harm me now,' and all for two cents.

An ardent devotee of the new fruit has improved on the Spanish method. He jabs a pointed stick firmly into the blossom end of the fruit, slices the peel from the stem in four sections, and turns these back in orange fashion. The trick of it all is to prevent getting any of the little irritating fuzzy spines, which cluster on the peel, in your fingers or mouth. The spines are not near so numerous as they are on the common prickly pear, and for the most part can be easily removed by gently brushing the fruit before or after it is picked. In addition to being delicious eating, a palatable drink, excellent jelly and other delicacies are made from the pulp. The juice, which is of a brilliant hue, is sometimes used as a water color and as a harmless coloring for desserts, candies, etc."

PARSNIP CULTURE.—Few vegetables change their edible quality, according to the soil they may be growing in, as the parsnip. To have the best results, they should be sown very early, in very rich soil where they may develop rapidly. In poor garden ground, they have a slightly bitterish flavor when wild, and the roots poor and stringy; they are poisonous when raw, at times. There are well authenticated instances of death, by children eating raw parsnip roots, that have grown in waste places. Heat destroys the poison. There are few more delicious and healthful vegetables than a properly-cooked, well-grown parsnip.

BEN DAVIS APPLE.—In mid-winter, the Ben Davis Apple is the chief kind in the markets of the East, among those that come from the westerly States,—as the Baldwin is from the East. It is not of the highest flavor, but is popular from the balance of good qualities.

LATE SPRING TRANSPLANTING OF FRUITS.—A correspondent asks how late in the spring the transplanting of cherries, peaches, plums and apples, may be safely deferred. That is a question that cannot be answered positively, of course. It would be much safer to say that it should be done as early as possible after the frost leaves the soil. The earlier it can be done, the longer is the time allowed for the earth to become settled around the roots, and the trees to recover the general shock of transplanting before they are called upon to actively engage in food-storing and the support of their leaves.

Good care in handling and planting figure largely in the results. A good pounding of the earth around the roots corresponds with the settling which time may bring; and a little water, given *when trees are in leaf or pushing* at time of transplanting, is sustaining until the roots can better look around for their own supply of moisture. But "good care" is often mistaken injury. The pounding of the soil is not done as it is being filled in, but after the hole is entirely filled, making a hard surface through which the needed air and water cannot readily penetrate. The surface never should be made hard—quite the contrary. Then again, instead of a moderate application of water, the trees are sometimes soaked every day all summer long, regardless of need and condition of soil. In heavy soil, it is best to refrain entirely from watering, as trees do not like to stand in water.

Cherries and plums object, as a rule, to being moved after commencing to leaf; pears and apples are less particular.

PEACH AND PLUM ROT.—Curculio has been looked upon as the greatest enemy of the plum, but, fortunately, that has been overcome—perhaps only temporarily—with the introduction of the Japanese type, on which the puncture of the curculio seems to have no effect. But there is also a fungus to contend with, which has the effect of decaying the fruit just before ripening. It comes very quickly, being little behind Fire Blight in the branches, in this respect. Some varieties are reported more susceptible to this rot than others. In the case of the peach, it separates the stone as the fruit is broken open. The Morris White Peach is especially susceptible. Other varieties are attacked.

The seat of the mischief is not generally known—whether the spores of the disease enter into the twigs, carrying the infection later to the fruit, or attack directly the fruit itself. In the former case, a cutting back of the branches would be advisable; otherwise, simple spraying at regular intervals, using Bordeaux mixture, is the remedy. The latter is generally considered sufficient. Overcrowded fruit is harmful.

CALIFORNIA FRUIT RESOURCES.—Though most persons know that California, as a fruit-growing State, is the wonder of the world, it is questionable whether the full extent of these resources are well understood. One great branch, now, is the preparing of stoneless raisins. A California paper said that over a thousand carloads of these would be shipped from Fresno alone, before the 1st of January.

tention was attracted by the very large and delicious cactus fruits which abounded on the fruit stands and were peddled on the streets of the towns. Conceiving that this might prove a valuable addition to California's already long list of fruits, I collected some of the best varieties obtainable. These were forwarded to the gardens of Timothy Hopkins, at Menlo Park, where they were cared for until ready for setting out.

The plants have grown equally well in the several parts of the State to which they were sent. Last year they fruited lightly, but the present season some of them have borne such immense crops that the branches have been broken under the weight. The fruits vary in color from bright carmine to yellowish orange; they are pear-shaped, oblong or nearly round according to variety. Some of them measure five inches in length, eight inches in circumference and weigh full eight ounces. They should always be allowed to ripen thoroughly, picked in the early morning and kept in the shade, as they are slightly insipid when warm. The fruits of the red varieties are most gorgeously colored when peeled.

INDIAN FIG CACTUS.

The Spaniard, Sicilian or Arab, who, from necessity or taste, makes a habit of dining on cactus fruit, carries a small piece of leather with a strap over the back, under which his fingers can be slipped. With this leather he grasps the fruit, the ends are slashed off with a sharp knife and a pronged stick or fork securely stuck into the side. The fruit is now held erect, a lengthwise cut made in the skin, which is turned back both ways, exposing the ruby or golden heart, as the case may be. In a twinkling this disappears down his throat in much the same fashion as a raw oyster is swallowed. This deft operation is repeated eight or ten times, when the curbstone diner saunters off with a Chesterfieldian air, 'nothing can harm me now,' and all for two cents.

An ardent devotee of the new fruit has improved on the Spanish method. He jabs a pointed stick firmly into the blossom end of the fruit, slices the peel from the stem in four sections, and turns these back in orange fashion. The trick of it all is to prevent getting any of the little irritating fuzzy spines, which cluster on the peel, in your fingers or mouth. The spines are not near so numerous as they are on the common prickly pear, and for the most part can be easily removed by gently brushing the fruit before or after it is picked. In addition to being delicious eating, a palatable drink, excellent jelly and other delicacies are made from the pulp. The juice, which is of a brilliant hue, is sometimes used as a water color and as a harmless coloring for desserts, candies, etc."

PARSNIP CULTURE.—Few vegetables change their edible quality, according to the soil they may be growing in, as the parsnip. To have the best results, they should be sown very early, in very rich soil where they may develop rapidly. In poor garden ground, they have a slightly bitterish flavor when wild, and the roots poor and stringy; they are poisonous when raw, at times. There are well authenticated instances of death, by children eating raw parsnip roots, that have grown in waste places. Heat destroys the poison. There are few more delicious and healthful vegetables than a properly-cooked, well-grown parsnip.

BEN DAVIS APPLE.—In mid-winter, the Ben Davis Apple is the chief kind in the markets of the East, among those that come from the westerly States,—as the Baldwin is from the East. It is not of the highest flavor, but is popular from the balance of good qualities.

LATE SPRING TRANSPLANTING OF FRUITS.—A correspondent asks how late in the spring the transplanting of cherries, peaches, plums and apples, may be safely deferred. That is a question that cannot be answered positively, of course. It would be much safer to say that it should be done as early as possible after the frost leaves the soil. The earlier it can be done, the longer is the time allowed for the earth to become settled around the roots, and the trees to recover the general shock of transplanting before they are called upon to actively engage in food-storing and the support of their leaves.

Good care in handling and planting figure largely in the results. A good pounding of the earth around the roots corresponds with the settling which time may bring; and a little water, given *when trees are in leaf or pushing* at time of transplanting, is sustaining until the roots can better look around for their own supply of moisture. But "good care" is often mistaken injury. The pounding of the soil is not done as it is being filled in, but after the hole is entirely filled, making a hard surface through which the needed air and water cannot readily penetrate. The surface never should be made hard—quite the contrary. Then again, instead of a moderate application of water, the trees are sometimes soaked every day all summer long, regardless of need and condition of soil. In heavy soil, it is best to refrain entirely from watering, as trees do not like to stand in water.

Cherries and plums object, as a rule, to being moved after commencing to leaf; pears and apples are less particular.

PEACH AND PLUM ROT.—Curculio has been looked upon as the greatest enemy of the plum, but, fortunately, that has been overcome—perhaps only temporarily—with the introduction of the Japanese type, on which the puncture of the curculio seems to have no effect. But there is also a fungus to contend with, which has the effect of decaying the fruit just before ripening. It comes very quickly, being little behind Fire Blight in the branches, in this respect. Some varieties are reported more susceptible to this rot than others. In the case of the peach, it separates the stone as the fruit is broken open. The Morris White Peach is especially susceptible. Other varieties are attacked.

The seat of the mischief is not generally known—whether the spores of the disease enter into the twigs, carrying the infection later to the fruit, or attack directly the fruit itself. In the former case, a cutting back of the branches would be advisable; otherwise, simple spraying at regular intervals, using Bordeaux mixture, is the remedy. The latter is generally considered sufficient. Overcrowded fruit is harmful.

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INTENTIONAL SECOND EXPOSURE

BIOGRAPHY AND LITERATURE.

THE FALSE HERO.

" And though the laurel on his brow
Seem green to those who worship him,
He feels the wreath, he knows not how,
Is withered, and its lustre dim.

None shall escape the ghostly hand
Of the avenging deity,—
Elude her wheel upon the land,—
Her rudder following in the sea."

HOWARD WORCESTER GILBERT.

SPECIES OF ROSES.—Usually, the number of varieties recognized by florists is far, very far, in excess of the species of a genus ; but in the genus *Rosa*, it is questionable whether the number of species, recognized by botanists as good species, is not far ahead of any list of garden varieties ever known. Professor Michel Gandover, in his *Essai sur une nouvelle classification des Roses de l'Europe, de l'orient, et du bassin Meditterranèen*, classifies 798 described by various authors, and two years afterwards added 95 of his own new species that he believed he had found in southeast France alone. What the result would be if he took the whole world into his monograph could only be expressed by Dominie Samson as "prodigious."

FORESTRY IN DUBUQUE COUNTY, IOWA.—Professor Thomas H. McBride has prepared a report on the woody plants of Dubuque County, Iowa, for the use of those interested in the forests of that section. He names and describes 79 species, and notes the uses that each may be put to. It is published in advance of vol. X. of the Iowa Geological Survey.

BOTANIZING.—By William Whitman Bailey.—An admirable little guide book to start the young botanist on the pleasant journey through life,—and for the mature botanist who desires to improve his methods by taking leaves from another person's book. Mr. Whitman Bailey, who is now Professor of Botany in Brown University, is one of the pioneers in botanical exploration in our country. He was associated with the late Sereno Watson, in the survey of the 40th parallel, and has been honored by Dr. Torrey in the genus Baileya, a pretty genus of Californian compositæ. No one is better fitted to prepare a collector's hand-book,—and few could tell the story so pleasantly and so well. It is published by Preston and Rounds, Providence, R. I.

HORTICULTURAL BOOKS FOR AMATEURS.—Where a comprehensive book on general gardening is desired,—one that will instruct the amateur in plain language, giving the principles of pruning, spraying, and landscape gardening as related to the home grounds,—Maynard's "Landscape Gardening as applied to Home Decorations" will be found among the most valuable. Of course, one cannot expect to go very far into details, where a great variety of information is attempted. Bailey's "Pruning Book" and Lodeman's "Spraying of Plants" are complete in their specialties. Bailey's "Garden-making" is on the order of Maynard's work.

MEMORIAL TREES.—The planting of trees in memory of some person is not uncommon. What is apparently an original idea, differing somewhat from memorial trees, yet commemorating a great event, is the arrangement of the oak and cedar trees in Blenheim Park, the seat of the Duke of Marlboro. According to an account by the *London Mail*, the trees are grouped in separate bodies, so as to indicate the position of the Dutch and English troops at the battle of Blenheim.

GINSENG.—Considerable attention is being given to the culture of this profitable root, and inquiries at this quarter are not infrequent. To these and others, it may be serviceable to state that Mr. Harlan P. Kelsey, of 1106 Tremont Building, Boston, has issued an illustrated circular on the subject, which is sent free to applicants.

THE FLORISTS' MANUAL, by William Scott, Florists' Publishing Co., Chicago. A reference book for commercial florists.

The author's first aim in preparing this work was to fill a felt want among florists—a book describing the best plants commercially with cultural advice founded on experience. Viewed in this light, it is a valuable and instructive work, very complete in its details. But it need not be confined to circulation among florists and others commercially connected, although gardeners and amateurs need not expect in it a work exactly fitting their requirements. Rather, judge it through the author's own words, *i. e.*: "If those who favor us with a perusal of its pages glean only one hint which may help them * * they will have received value for their money." A work resulting from Mr. Scott's long and varied experience, "from selling a bunch of violets over the counter to planting a tree or seeding a lawn or building a greenhouse," cannot but throw out many hints of value to any one interested in any line of horticulture or flower gardening. The comparatively small index confronting the reviewer at first is far from encouraging, but as the purpose of the author is more clearly brought to light, it is better appreciated. It shows the intention to treat of the most desirable and profitable things to handle—a condensation which many will enjoy. Many interesting subjects are brought to headings such as "Easter Plants," "Watering," "Decorations," "Potting," "Bedding Plants," etc. Not the least of value to the possessor of this book, are the beautiful half-tone illustrations, numbering more than one 100, and thoroughly illustrating the subjects treated. Critical persons may object to the interspersing of advertisements with the reading matter, though it is not made very abtrusive ; yet it must be remembered that the work is designed for commercial purposes, and not strictly as a library book.

HEARD'S ISLAND CABBAGE. — It is well known that Kerguelen's Land produces a very interesting species of wild cabbage, *Pringlea antiscorbutica*. I found a newspaper paragraph which speaks of a Heard's Island cabbage. Are the two identical? Heard's Island is an even more remote and far-away place than Kerguelen Land. C. W. G.

GENERAL NOTES.

WISTARIA—KRAUHNIA.—It would be almost laughable, if the endless confusion were not so trying, when one hunts around, to find what some unheard of name belongs to, and finds some old familiar plant with a new name. If a plant of *Krauhnia* were offered a person, it might be rejected as probably being some delicate house plant, too troublesome to have around, or possibly a noxious weed. But as *Wistaria*, the whole being changes—it becomes a welcome article. Whatever botanists may try to do to restore long-forgotten names, it is out of the power of horticulturists to change them. The name of *Wistaria* is so generally diffused, that not even the famous seven-leagued boots could bring *Krauhnia* up to displace it.

AMERICAN PARK AND OUTDOOR ART ASSOCIATION.—The avowed purposes of the American Park and Outdoor Art Association are, "To promote the conservation of natural scenery, the acquirement and improvement of land for public parks and reservations, and the advancement of all 'outdoor art' having to do with the designing and fitting of grounds for public and private use and enjoyment."

During the three years of its existence, this Association has shown an earnest desire to further work in the lines laid down ; and considerable success in bringing together the foremost men in professions allied to such work. It is safe to prophecy a brilliant future for this organization, which is worthy of all the cooperation the American public can lend. At the last annual meeting, held in Detroit, Mich., June, 1899, papers with the following titles were read and discussed : — "Boston Common," "Relation of Reservoirs to Parks," "The Parks and the People," "Finger Boards and View Points," "Outdoor Art in School and College Grounds," "The Development in Children of Interest in Outdoor Art," "Park Nomenclature and Accounts," "The Care of Walks and Drives," "The Improvement of Factory and Home Grounds," "Park Landscapes."

The membership numbers about 300. Annual fees for active members $5.00 ; associate $2.00. The Secretary is Mr. Warren H. Manning, Boston, Mass. The annual meeting for 1900 will be held at Chicago.

GINSENG.—The U. S. Department of Agriculture has issued a Bulletin, No. 16, on American Ginseng, prepared by George V. Nash. The roots have increased in value from 52 cents a pound, in 1858, to more than $3.00 per pound, in 1893. In the ten years preceding 1893, the value of the export (principally to China) ranged from $600,000 to $1,000,000 per annum. It is getting scarce in a wild state, and as much as $4.75 per pound has been recently paid. It is now being profitably cultivated.

It is believed to have no real medicinal value, though in all cases of medical craze, numbers of Chinese will testify to its wonderful virtue. Some of the roots are divided so as to form a rough outline of the human form, as sometimes the mandrake does,—and, it is believed, the faith in the virtues arose from this resemblance in both instances.

The State laws have been iron-clad for the preservation of Ginseng in the southern forests, which have been just as successful as laws in other States against the spread of weeds, insects, forest fires, and fungus diseases. Laws against the appearance of comets, or the shocks of earthquakes are in order,—but if it can be shown that watchers may be appointed, and money appropriated for the purpose, these useful regulations may yet appear on our statute books.

ORIGINATORS OF NEW VARIETIES.—So far as we know, the only person in America who has made a specialty of raising new varieties of flowers and fruits, with the view of profit, is Mr. Luther Burbank, of California. In the Old World, this is made a special branch of business. The party or parties give the whole of their time to hybridizing and selecting, and, when they have a good thing, find no difficulty in getting a handsome price from some nurseryman or seedsman for the whole stock. Possibly one reason why this branch of the profession has not made for itself a foot-hold in America, is from the difficuly of finding persons in the trade who are willing to give the price for the whole stock of a given variety commensurate with its real value. As a general rule it costs enormously to advertise properly a new variety so as to get it well in the market, and a fair price can therefore seldom be offered to the originator. In the case of some varieties of grape or other fruits, good prices have been given to the originator; but in these cases, it is pretty well forseen by those who purchase the stock that judicious advertising would bring an abundant reward. It is not often that this can be foreseen, as the public taste is very variable.

INDIAN CIVILIZATION.—Canada seems to be doing better in Indian civilization than the United States. Instead of moving them to new locations to teach them gardening and farming, where all is absolutely new, they are encouraged by a system of progressive development to improve on the spot with which they are already acquainted. Dr. Wm. Saunders, the Director of the Dominion experiment stations, has been making his annual tour among the Indians of western Canada, and gives the most encouraging accounts of their progress. He notes this especially of the Doukhobors. They have taken to cultivating their land with remarkable industry, and are increasing their villages rapidly. Fruits, vegetables and fish, are their chief food, and they seem to have abandoned the chase. They also avoid the use of intoxicating liquors or tobacco. They are raising chickens, and have butter, cheese, milk and eggs. They are making bread from a low grade of flour from their own growth of grain,—and are very fond of vegetables like beets, cabbage, onions and potatoes.

They still retain the custom of the northwest Indians, in having one large house of poles and logs for a whole family, but have progressed so as to divide the sleeping apartments one from another. In a few instances they have introduced a white man's comfort—a feather bed. It is not unusual to have from 25 to 40 individuals in a single house. In a double tier of beds, the upper ones are reached by a ladder. They have got so far as to find a use for steam. They heat stones red hot and pour them in water, and then, in their "bath house," rub themselves in the steamed atmosphere with the dried branches and leaves of the Mossy-cup Oak, *Quercus macrocarpa*. They even cook part of their food by steam thus generated. They are fond of labor, and readily hire themselves out for the railroads that are constructing branches through their territory, and prove to be remarkably good laborers. They are hardly self-sustaining, and get some assistance from the Canadian Government.

MAMMILLARIA MISSOURIENSIS.

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NUTTALL'S MAMMILLARIA.

NATURAL ORDER, CACTEÆ

MAMILLARIA MISSOURIENSIS, Sweet.—A smaller species than *Mammillaria vivipara*, globose, simple, with fewer (10 or 20) ash colored spines; flowers yellow; berries scarlet, sub-globose; seeds globose, pitted.—See *Coulter's Manual of Rocky Mountain Botany* and Gray's *Manual of the Botany of the Northern United States.*

This will probably be regarded as one of the most interesting of all the cactus family. Few have holly-like berries in their best condition during the flowering season, or have the flowering spread over a continuous season of several months, as is the case with this species. Its beauty is not, however, fully realized, even by Mr. Lunzer's faithful drawing, for at noon on sunshiny days, the flower is so fully expanded as to have a vase-like form, exposing the stamens and pistils to full view, and which add very much to the interest the lovers of cactuses take in them. The plant here figured came originally from Dr. C. C. Parry, and was collected in Wyoming. Growing in a warm, sunny place, the first flowers appeared the first week in May; but it was not until the first of June that the flowers appeared in numbers, and it was early in July before the flowering stage was wholly over. It is difficult to note the behavior of cactuses when in their flowering condition in a wild state, from the fact that the collector is moving from place to place. He collects the specimen when he comes to it, and then passes on in search of other treasures. And yet much of the interest presented by these plants is derived from their flowers, and their behavior while in flower. In a garden, these matters can be watched more closely. On June 1st, a point was made to watch closely the opening and closing of the flowers, and thus to note facts that would not be observed by the general botanical collector.

In plants of many species outside of the cactus family, some will flower in the spring from buds in some measure perfected during the previous growth-season. Others will make flower buds and develop flowers on the wood of the same season, as growth develops. This law also prevails among cactuses. Some will send out flowers from the mature growth of the past or even of some more remote year,—others bloom from the new growth of the plant, and as that growth progresses the flowering proceeds. *Mammillaria Missouriensis* is of the latter class. The new tubercles may be seen rising with the clear and bright spines from the apex of the plant, and from between these at the base of some one tubercle the flower buds are seen to rise. On June 1st, as above noted, our plant presented, at 9 a. m., the appearance represented in the picture. The flower was about two inches long, tapering to a narrow tube at the base. The sepals and petals were linear-lanceolate, tapering towards the apex into a sharp, awl-shaped point.

The sepals are strongly ciliate. The pistil at this time was within a half-inch as long as the petals, and four-cleft, the divisions somewhat more erect than horizontal, and bright yellow. The style was about half an inch longer than the stamens, and rather slender for a cactus. The numerous anthers were bright yellow. The filaments were twisted horizontally into a tight ball, the yellow points of the anthers only being scarcely visible above the mass. Spines 12–15, about half an inch long, almost equal in size, slender, with brownish tips,—the central one usually turned upwards. Tubercles or mammæ half an inch long by quarter-inch wide, cylindrical, obtuse at the apex, deeply grooved above. Berries scarlet, two-thirds the length of the tubercles, ovate, somewhat compressed. At this date, the berries are beginning to shrivel. Petals yellowish-brown, with a dark brown centre. This extract from the note-book is instructive, as showing the points requiring examination in distinguishing one species from another.

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COLOR PLATE
INTENTIONAL SECOND EXPOSURE

taken, and without reference to the previous note, so that any variation may subsequently have special attention. This was taken at midday and reads:—"Flower now broadly expanded, about two inches wide, though the petals themselves are about an inch and a half long, the flower being somewhat salver-shaped. These petals are greenish yellow with a brown mark, one or two lines wide, running down the centre, but tapering gradually along their whole length. Filaments deep brown,—anthers golden yellow; style a little longer than the stamens; stigmas 4 to 5 lines wide, narrowing towards the apex, and presenting a somewhat stellate appearance."

Passing now to the fruit, it will be noted that though the flowers come out from the new growth at the apex, the red berries are lower down and among the tubercles of last year. This arises from a remarkable fact first noticed and placed on record by the author of this paper, that some species of *Mammillaria* have their ovariums remain absolutely at rest for a year after the flowers wither. This behavior is well known to occur among oaks and other species of plants, but had not heretofore been noted among cactuses. Just as the new growth of the season commences its development, these seed vessels of last year also make their renewed growth. Their growth must be very rapid. The author has never seen it in progress. A plant with no sign of fruit on a certain day will be covered with the full-sized berries a day or two after.

It has been often noted by botanists versed in matters connected with classification, that it is not easy to define the line drawn by nature between a cactus and a gooseberry. The tendency in the gooseberry and in the cactus to be alike spiney will occur to every one,—and, as the fleshy fruit given in the plate shows, the gooseberry character is well simulated. Moreover, in studying the morphology of cactuses, the student derives many good hints from a previous examination of the gooseberry.

Aside from the succulent character, there is indeed little more than the tendency in the cactus to produce a greater number of stamens and petals in the flower, to distinguish the order from the gooseberries.

The species was among the first of the *Mammillaria* to be discovered in our country. Nuttall, in his "Genera," published in 1813, notices it, but supposed it was the same as *Cactus Mamillaris* of Linnæus, a sub-tropical species, though he remarks on the smaller size of the American plant; and he expresses surprise that a tropical species should be found able to endure the severe winters of the "high hills of the Missouri." It was ultimately discovered not to be that species, and Engelmann described it as *Mamillaria Nuttalliana*, under which name the best part of its history is to be found. Sweet, however, had named it in the "*Hortus Britannicus*," published in 1826, *Mamillaria Missouriensis*, and this seems to be the name that will generally prevail.

In the United States, it is probably more widely distributed over what is known as the cactus belt than any other species, and, as is usual with many plants under such conditions, has some geographical variations, which have been regarded as good species by some botanists, varietal forms by others, and by others again as only such variations which ought to be gathered in under the one specific description. That is to say, instead of giving new names to the slight variations, the description of the species should be broad enough to cover them all.

On the whole, the members of the cactus family of which our *Mammillaria* is a member, afford good material for the study of the hypothesis, popular at the present time, that new species have been developed from older ones chiefly by changes in their surroundings. This is known as the doctrine of environment, and the whole subject is known as ecology. For instance, cactuses have a hard epidermis, not permitting the escape of moisture, and thus permitting them to thrive on arid plains where little rain falls. So far the hypothesis approaches the condition of a sound theory. We see that they are perfectly at home in these environs. But when removed again to situations that are acceptable to other plants that transpire freely, they seem to show no disposition to go back to their original condition. Our species has wandered from its arid home, to the companionship of ordinary vegetation, retaining all its arid habits, even under mountain snow.

EXPLANATION OF THE PLATE.—1. Mature plant of several years growth, from Wyoming. 2. Tubercle with its crown of horizontal spines. 3. Berry of natural size. Seed magnified,—showing the dotted surface, and the attached placenta.

WILD FLOWERS AND NATURE.

HAS SPRING COME YET?

Tell me, for I long to hear,
Tidings of our English year.
Was the cuckoo soon or late?

Have the apple blossoms burst?
Is the oak or ash the first?
Are the snowballs on the guelder?
Can you scent as yet the elder?
On the bank-side that we know
Is the golden gorse ablow?

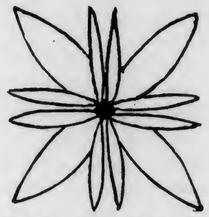
An Englishman's letter to home.

ALFRED AUSTIN.

HABENARIA FIMBRIATA.—A specimen sent the conductors for identification proves to be the Purple-fringed Orchis, *Habenaria fimbriata*. Besides its color, it differs from the species illustrated in the February issue of the MONTHLY, in having very large size flowers. This specimen was collected at Sugar Mill, N. H., which is within the known habitat of this species. The flower stalk is about two feet in height, six inches of it being occupied by the flowers. They have no odor, but make a beautiful cut-flower, lasting for a long time, like other members of the orchid family to which this belongs.

SANGUINARIA CANADENSIS.—The fugacious character of the petals of the American Bloodroot, alluded to in the January issue of the MONTHLY, as preventing this beautiful spring flower from being much gathered for indoor decoration, can be to some extent circumvented by plucking not full blown flowers but buds. The latter, taken with as long stalks as possible, and placed in water indoors, will open quickly and remain in flower for a couple of days or more, charming all that behold them.

Last spring we were interested in observing the petals of flowers on such stalks, which we had set in a tumbler of water, increase perceptibly in length after the first expanding. The use of a measure showed that flowers, which on the first day of opening had a diameter of one and one-quarter inches, had increased it on the second day to one-and-one-half inches. Another fact we noted was that the mature blossoms, instead of being circular in outline, were in reality rectangular or square. The ground work was a cross of four broad petals, like the plan of a crucifer, and on these was superimposed a set of eight narrow petals in pairs, each of which filled a space between two of the wide petals, thus:



SANGUINARIA PETALS.

To what extent our flowers were typical or exceptional, due to imperfect development in water, I have not since had an opportunity to observe. C. F. SAUNDERS.

Philadelphia.

THE EARLIEST FLOWER.—Last Thursday, it snowed four inches deep; Friday, towards evening, the weather moderated. Some time in the night, it began to rain. It rained all day Saturday and cleared away by Sunday morning. Then it blowed—a howling northwester all day Sunday, growing colder all day, and in the afternoon I walked out to hunt up a warm spot in the woods. As I walked, I noted the snow-drifts from a few inches deep to over two feet, scattered here and there. The snow on the level had been washed and diluted by the copious Saturday's rain, and was gone. The snow in the drifts was very much in evidence. The wind was cold and biting, and as I walked amongst the rocks, examining the plants, I saw a tiny flower, pink-purple, looking up into my face. I have often seen these flowers before, but never have met with them under the present circumstances—snow one day

and the day following the plant in bloom! The flower, expanded, measured ¼ of an inch. The plant, as it stood in the ground, measured one inch in height. It had also, on its side branches, several buds all ready for blooming. These plants have terminal flowers, a single blossom on a long peduncle, which vary from white to pink up to dark purple. This little plant was loaded up to distinguish itself—and it did. It belongs to the *Cruciferæ* family. I have not been able to find its specific name, but hope to when they become more plentiful. The spring beauties, *Claytonia*, have had buds on them sometime before Christmas,—those which are rooted on the rocks with southern exposures. They have waited a long time, but we are going to have spring soon and then they will blossom forth and be happy. The Early Crowfoot, *fascicularis*, is not in it this year. I have not been able to find a single bud on any of them; but another day like to-day may bring them out, although the ground now is frozen solid; yet the sun is out and the days are legthening and the ice is bound to melt. The sweet harbinger of spring, that I found yesterday, tells me in my heart that spring is near—is very near.

F. K. STEELE.

Festus, Jeff. Co., Mo., February 27, 1899.

REASON AND JUDGMENT IN THE LOWER ANIMALS.—Under the above heading, the *reasoning* power of a yellow-jacket-wasp was recently given at length in MEEHANS' MONTHLY.

If that insect had scented the partly rotten apple, why did it search every cranny in the room before it found it?

"The solitary wasp must have scented the rotten apple from a long distance," and after a long search gave it up. Why did he not scent another apple, and "make a bee line for it," out of the window again?

I have seen yellow-jackets, bees, flies, and other insects get into corkless bottles placed up-side-down, and die in there—just a little reasoning would have meant liberty to them. Birds sometimes get into rooms and injure themselves by flying against glass in trying to get out.

The animal instinct leads insects and birds towards the light, and many are killed by flying against windows, gas and electric lights and light-houses.

That solitary yellow-jacket, last October, did just as instinct prompted it to do—go towards the light and look for something to eat.

Peekskill, N. Y. S. DICK FERRIS.

TURTLES AND TOADS.—Cautiously, the turtle stretches out her head to survey the territory and see if it is free of danger, before she ventures across the path, while the toads are still in hiding, buried under the loose earth, which their sensitive nature prefers for a covering against the wet and cold above ground. We have learned now generally to recognize these useful creatures as valuable helpers in destroying noxious insects of the garden. Two hundred years ago, one, Rev. George Burroughs, a graduate of Harvard College, was in the witchcraft delusion of Salem, and unmercifully hanged on the gallows. One of his accusers testified as proof of his compact with the devil that he kept toads in his house and cellar.

MRS. S., in *Hartford Times*.

VITAL ENERGY.—Live plants are plants with their particles in motion building up the plant's structure. This motion is known as vital energy. Physical energy results in decomposition. The material out of which plant structure is formed is known as protoplasm. The forms of flowers result from varying degrees and directions of vital energy,—but what starts the motion in protoplasm, and so directs the energy that a little cell may develop in one instance to an oak, or in another to a buttercup, has not been demonstrated. We speak of vital force, or life-energy, as a fact, but no one has yet discovered what starts the movement.

CYPRIPEDIUM ACAULE.—*Cypripedium acaule* has received considerable notice through your columns during the past year. Some of the writers mention having found it in oak barrens, and others in pine woods. In this locality, we have taken it in hemlock woods, huckleberry swamps which are submerged in spring but dry in summer, wet mucky swamps and in always-wet moss. North of the Georgian Bay, we have commonly seen it in small patches of moss on otherwise bare and dry rocks. J. W. Tyrell, C. E., of this city, has found it growing on dry hillocks of sand and boulders in lat. 57° 30′, long. 107°; and Gray gives its southern limits as North Carolina.

Now I would like to know why a plant, which grows naturally under such a variety of conditions in regard to climate, soil and water supply, is so hard to cultivate. Perhaps it is not difficult to manage, but we have not succeeded, and would like to be informed as to some fairly successful method of outdoor cultivation. There is no trouble in forcing it once in damp sphagnum moss, and we expect to see some in bloom in a couple of weeks.

While in the swamps, I would also ask if any of your correspondents have noticed the large number of intoxicated bees upon the flowers of *Ledum latifolium*.

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SWARMING OF BUTTERFLIES.—A correspondent from Yadkin Valley, South Carolina, says: "Did you ever see a swarm of butterflies, two or three hundred in a mass, alight at the same time and place? I did, last September. For two or three evenings, the ends of the branches of a large hickory seemed to turn brown, and then silver, as the butterflies (*Danais Archippus*) fanned themselves to sleep. It was a strange and very pretty sight."

CHRYSANTHEMUM FRUTESCENS.--PARIS DAISY AT HOME.

COLLINSONIA CANADENSIS.—A somewhat interesting wild-flower is the Horse-balm, *Collinsonia Canadensis*. The yellow flowers are not as showy as some others, but are produced in large terminal panicles which look well when the plants are growing together in great numbers—a not unusual thing. The large leaves make the flower panicles more conspicuous, but are quite a coarse, ordinary type, and do not help the amateur much in identifying the plant—the flowers, appearing in August and September, will. It extends through the Eastern States from Canada to Florida and west to Wisconsin, in woods.

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INTENTIONAL SECOND EXPOSURE

GENERAL GARDENING.

THE BROOK'S SONG TO SPRING.

O beauty—vision of forgotten gladness !
  Promise of all the years, that ne'er betrays !
O miracle of hope and balm of sadness !
  Creative ecstasy and fount of praise !

. . . . . .

I lay upon the ground and gave no token,
  I hid my face midst sodden leaves and sere,
My languid pulses chill, my spirit broken,—
  I dreamed not, O divine one ! you were near.

The snows and frosts of winter, long departed,
  Seemed leaden on my breast and weighed me down,
And I forgot, forlorn and heavy-hearted,
  Your goodness, goddess of the violet crown !

Then, soft as music in remembrance sighing,
  You fanned me with your wooing breath, and I,
Who shed no tears when lone I lay and dying,
  Wept at your touch, and knew I should not die !

. . . . . .

Along my banks are tender blossoms blowing ;
  They gently nod their heads, and smile at me,—
But, ah ! I hasten to the river, knowing
  The river will lead onward to the sea !

High over me the budding branches quiver
  With songs that swell in happy harmony,
But sweeter seems the murmur of the river,—
  The river that leads onward to the sea !

FLORENCE EARLE COATES, in *Outing*.

MAGNOLIA GRANDIFLORA.—The greatly reduced figure of the *Magnolia grandiflora*, from a photograph sent by Anderson and Price, Ormond, Fla., gives an idea, though faint, of the form and beauty of this noble denizen of our southern forests. It is almost intoxicating to walk through a group of them when in blossom in early spring. The odor can surely not be exceeded by the groves of the famous "Araby the blest" of the poets. And then the broad, shining, evergreen leaves, give such a marked character to the trees, that one can scarcely believe he is in an ordinary American forest. As in most cases of plant species, there are great and striking variations in the individuals. Some have very narrow leaves,—indeed, a botanist would term them linear-lanceolate; other trees will have the leaves nearly round. In these cases the petals follow the leaves and are narrow. In the round-leaved cases, the petals are round. The illustration is of a round-leaved tree. A great difference is

MAGNOLIA GRANDIFLORA.
(GREATLY REDUCED.)

also to be found in the tint of the under surface. At times we see the under and upper surfaces are of nearly the same shade,—in other cases the leaves beneath are of brilliant brown, almost, indeed, of a golden hue in exceptional cases. They often reach 75 feet high, and eight or nine feet in circumference.

The *Magnolia grandiflora* will stand a good deal of frost if sheltered from cold winds. Under such conditions it is hardy as far north as Philadelphia.

SOME TREES AND SHRUBS OF EXTREME HARDINESS.—In speaking of hardy plants, it should always be borne in mind that cold alone is not the only condition affecting them. The results may be varied by a dry or moist atmosphere ; by certain degrees of light ; by exposure to winds ; or by location—whether in moist or dry soil. Or the nature of the summer preceding a winter's test may affect the vitality or state of the tree, and subject it to injury.

It is the purpose of this chapter to record those plants which have proved capable of standing extreme cold. As to what localities they will be suited, as regards general conditions, this must be demonstrated by trial. The list is largely based on the report of Dr. Wm. Saunders and Prof. Macoun, of the Central Experimental Farms, Ottawa, Canada. Mr. Macoun well says :—

"It is interesting to note the greater degree of hardiness of individual specimens of some trees and shrubs which, when first planted, killed back one-half or more each year and which appear to be getting hardier every year. Illustrations of this are the Smoke tree (*Rhus Cotinus*), Flowering Dogwood (*Cornus florida*), English Hawthorn (*Cratægus Oxyacantha*), a few individuals appearing to get hardier each year."

Acer Japonicum.
Amelanchier alnifolia.
Berberis Fremonti.
Berberis Thunbergi.
Berberis vulgaris.
Berberis vulgaris foliis purpureis.
Betula alba.
Catalpa Bungei.
Catalpa Kæmpferi.
Cephalanthus occidentalis.
Cercidiphyllum Japonicum.
Clematis crispa.
Clematis Virginiana.
Clematis Vitalba.
Cornus alba.
Cornus alba Sibirica variegata.
Cratægus coccinea.
Cratægus cordata.
Cratægus Crus-galli.
Cratægus Oxyacantha.
Daphne Cneorum.
Diervilla sessilifolia.
Euonymus alatus.
Euonymus atropurpureus.
Euonymus Europæus.
Euonymus nanus.
Fagus ferruginea.
Fontanesia phillireoides.
Forsythia intermedia.
Fraxinus Americana.
Fraxinus Americana acubæfolia.
Fraxinus excelsior.
Fraxinus excelsior aurea pendula.
Fraxinus excelsior pendula.
Genista sinensis.
Gymnocladus Canadensis.
Halesia tetraptera.
Hydrangea paniculata hortensis.
Ilex glabra.
Ilex (Prinos) verticillata.
Juglans cinerea.
Juglans nigra.
Juglans Sieboldiana.
Kalmia angustifolia.
Ligustrum Ibota.
Lonicera bella.
Lonicera bella candida.
Lonicera Morrowi.
Lonicera Phylomelæ.
Lonicera sempervirens.
Lonicera Tatarica.
Lonicera Tatarica alba grandiflora.
Lonicera Xylosteum.
Morus alba.
Morus alba Tatarica.
Morus alba, Tea's Weeping.
Myrica aspleuifolia.
Ostrya Virginica.
Oxydendron (Andromeda) arboreum.
Pachysandra terminalis.
Philadelphus coronarius.
Philadelphus coronarius foliis aureis.
Philadelphus Gordonianus.
Philadelphus grandiflorus.
Platanus occidentalis.
Populus alba pyramidalis (Bolleana.)
Populus balsamifera.
Populus laurifolia.
Populus nigra pyramidalis (Lombardy.)
Potentilla fruticosa.
Prunus Davidiana.
Prunus (Amygdalus) nana flore albo.
Prunus (Cerasus) Pennsylvanica.
Prunus (Cerasus) Padus.
Pruuus (Cerasus) ranunculæfolia.
Prunus (Cerasus) serotina.
Prunus (Cerasus) Virginiana.
Ptelea trifoliata.
Ptelea trifoliata aurea.
Pyrus baccata.
Pyrus coronaria.
Pyrus Malus flexilis.
Pyrus spectabilis flore pleno.
Pyrus Toringo.
Pyrus Aucuparia.
Pyrus arbutifolia.
Quercus alba.
Quercus bicolor.
Quercus dentata.
Quercus imbricaria.
Quercus macrocarpa.
Quercus nigra.
Quercus pedunculata (robur).
Quercus pedunculata (robur) Concordia (Golden).
Quercus Prinus.
Quercus rubra.
Rhamnus cathartica.
Rhododendron Indicum Kæmpferi.
Rhododendron (Azalea) nudiflorum
Rhododendron (Azalea) viscosum.
Rhododendron maximum.
Rhus aromatica.
Rhus glabra.
Rhus typhina.

Acer Japonicum and A. polymorphum, Japanese Maples, will be welcomed with delight as hardy plants. The Blood-leaved variety is, of course, the most popular, and it has been proven hardy not only in Canada, but in northeastern New York and Wisconsin. It seems to do best in good, rich soil well-drained. *A. Japonicum aureum*, *A. polymorphum reticulatum* and *cristatum* while hardy are not constitutionally strong.

Berberis Fremonti is a beautiful, rare species with glaucous foliage shaped not unlike small holly leaves. It has not yet received the attention it deserves.

Berberis Thunbergii as a dwarf bush or low hedge plant is unsurpassed. Its foliage and bright red berries are so ornamental, the absence of showy flowers is not noticed.

Berberis vulgaris and variety *purpureis* are both suitable for hedges.

Birches thrive splendidly in the coldest climates in rocky, well-drained soils.

Catalpa Bungei is very dwarf—simply a shrub, unless grafted on stems, which is most frequently done. But it might be used to advantage oftener in bush form.

Clematis crispa has very unique flowers, quite unlike the large-flowered and *paniculata* types. They are bell-shaped, the petals remaining closed except as towards the ends they reflex.

Cornus alba has bright red stems in winter, thrives in low situations.

Cratægus coccinea is beautifully clothed in its bunches of large red fruit, about the size of a small crab-apple.

Cratægus cordata grows more shapely than *C. Oxyacantha*, and bears pretty bunches of red berries, which with the true hawthorn leaves almost give the impression, from a short distance, of a holly in fruit.

Cratægus Crus-galli, with its heavy thorns, makes a defensive hedge.

Fraxinus Americana is a superb, rapid-growing tree for sidewalk planting.

Gymnocladus Canadensis, though it does not make a very uniform growth while young, develops into a very satisfactory tree,—and it does especially well along the sea-coast. It bears very thick, black pods which remain on the tree all winter.

Halesia tetraptera, scarcely a medium-sized tree, is remarkably beautiful when covered

with its clear white, bell-shaped flowers in earliest spring.

Hydrangea paniculata grandiflora is something everyone likes, and is especially valuable on account of late blooming. It does well in drained soil.

Juglans Sieboldiana produces clusters of pointed nuts, a trifle smaller than those of the Black Walnut. The quality of the nuts has not yet been generally criticised.

Kalmia angustifolia appears a trifle hardier than the well-known *K. latifolia*. Its flowers are pretty, but smaller and more numerous. The leaves, too, are small and narrow.

Ligustrum Ibota may take the place of *L. ovalifolium* in the colder climates.

Lonicera Tatarica grandiflora has flowers much showier than the type.

Morus "Tea's Weeping" makes a fine specimen bush, especially when grafted on very tall stems. The branches invariably reach the ground.

Oxydendron arboreum, usually termed *Andromeda arborea* by nurserymen, makes a small tree having long, narrow, glossy green leaves, the latter turning brilliantly in colors in autumn.

Pachysandra terminalis is commonly classed with herbaceous plants, by reason of its low-growing, spreading character, making it useful for ground-covering. It is evergreen, growing three or four inches in height, and producing whitish flowers in spring, around which honey-loving insects swarm in great numbers.

Prunus Davidiana is doubtless the first of all plums to flower, which it does profusely.

Prunus Padus makes a handsome specimen in growth, flower and strings of black fruit.

Pyrus coronaria has a leaf quite distinct, somewhat palmately formed, which takes on beautiful autumn coloring.

Pyrus Aucuparia, the well-known Mountain Ash, does well on drained soil, provided the borers leave it alone. The showy, orange-red berries, borne in liberal bunches, make it well worth a trial.

Rhamnus cathartica is a common hedge-plant.

(Concluded in April.)

LINARIA CYMBALARIA.—I was much surprised, a few days ago, to find that *Cymbalaria Cymbalaria* (*Linaria Cymbalaria*) had "introduced" itself on a little strip of the lawn, and was growing vigorously and blooming quite freely.

It is now past the middle of November, and the dainty little plant, though so delicate and tender looking, has resisted the frosts which stripped the leaves from the *Ampelopsis quinquefolia* some six weeks ago.

Three or four years ago, some hanging baskets were filled with this vine, branches or seeds of which must have given rise to this little colony, which now seems so thrifty and so at home.

The locality is close along the base of the lattice of the front porch, facing the north. The close proximity to the lattice protected it from destruction by the lawn mower, (together with a little carelessness in trimming).

I found, in digging up enough of the vine for a nice jardiniere through the winter, that some of the vines had wound in and out along the lattice to a length of three feet or more.

Columbus, Ohio. MRS. W. A. KELLERMAN.

A FEW GOOD BEDDING GERANIUMS.—At this season of the year, when almost any flower is welcome, few, if any, are more attractive than the new hybrids of which such an almost endless variety exists.

One hundred and twenty-three named varieties were grown here for trial this year. Out of this number, one hundred and fourteen survived the summer.

The plants that were lost were of the English, round-flowering type, chiefly, thus demonstrating their uselessness for our arid summer heat.

Duplicates of all were in stock, however, and those that were useless for outside work proved to be the best for indoor culture. Some varieties require a light shade,—others full sun; and one has to experiment a little to ascertain their requirements. In an article of this kind, only a few can be described, and the following ten varieties, all of which are single, are superb, leaving nothing whatever to be desired as to robustness of growth, freedom of blooming, and beauty of color; and any reader eager to obtain good varieties cannot do better than include them in their list.

To-day, January 24th, all are in flower and promise to continue so for a long time to come.

Ian McLaren.—Splendid salmon.

Gen. Dodds.—Intense scarlet, fine.

Mark Twain.—Superb, white, veined salmon; good truss and florets two inches across. A gem.

Pierre Lebruin.—White; intense solferino edges. Excellent; a good grower.

Torrain.—Beautiful pink splashed with purple. Extra good habit, truss and grower.

Phyllis.—This is the queen of all. A lovely salmon rose; fine flowers, trusses ten inches across. A gem.

Lucreece.—A fine pink.

Wintie.—Bright, rosy scarlet.

M. de la Roix.—Splendid salmon.

Mrs. E. Rawson.—Intense scarlet.

This variety ought to be in every collection. It is a beauty. Its flowers possess that beautiful velvety appearance so much desired in geraniums. In another article, I shall name and describe a dozen best doubles, some of which are superb.

Rahway, N. J. A. P.

NEW OR RARE PLANTS.

NEW GERANIUMS FOR CONSERVATORY DECORATION.—Henry A. Dreer reviews the newer geraniums as follows:—"While undoubtedly the most popular of bedding plants, Geraniums, deserve to be used more extensively for window and conservatory decoration, no other plants excelling or even approaching them for brilliancy and richness of color.

Unfortunately, the value of the many fine varieties annually imported has been determined by their ability to withstand our severe climatic conditions when bedded out, and as few have stood this test, many of the very choicest sorts for indoor culture have been lost sight of.

In the following lists, the aim is to make the selection combine in the highest degree perfection of form and size of the individual florets, size of truss, purity of color, habit of plant and general excellence, and especially recommend them for the embellishment of the conservatory and window garden.

DOUBLE GERANIUMS.

J. B. Varrone.—Fiery carmine, with large white centre, shaded with rosy lilac; semi-double.

Richelieu.—Deep scarlet, shaded with fiery orange, with maroon veiling; semi-double.

Mme. Carnot.—Purest snowy white.

Pasteur.—The brightest and purest scarlet of all.

M. Canovas.—Brilliant fiery scarlet, veined with maroon.

Jean Remeau. — Snow-white, veined with rosy violet, petals bordered with bright crimson; semi-double.

SINGLE GERANIUMS.

Chateaubriand.—Brilliant scarlet, with maroon shading and delicate black veins on the upper petals.

Daumier.—Soft rosy-lilac, with small white blotch on the upper petals; the centre of the flower heavily spotted with rosy anilene; one of the choicest of the Picotee section.

Lord Kitchener.—Three lower petals soft scarlet; two upper clear cherry red.

Mary Pelton.—Very delicate pale salmon; a beautiful shade.

Oliver.—Centre of flower snow white, suffused with a rich magenta shade, bordered with glowing scarlet around the margin of the petals.

Ponschkine.—Brilliant anilene violet, two upper petals blotched with pure white, the centres of the lower petals shading into rosy white.

IVY-LEAVED GERANIUMS.

Achievement.—A distinct shade of soft salmon pink; semi-double.

Leopard.—Large semi-double flowers of remarkable coloring, the ground color being clear lilac-pink with heavy carmine blotches over the upper petals; absolutely distinct from any previous introduction, and may be aptly described as a Lady Washington Ivy-leaf. Unquestionably the greatest break in this section ever obtained.

The Bride.—Double pure white; creeping habit."

A warning should accompany recommendations of geraniums for window-culture. Quite frequently, an attempt is made to flower them out-of-doors all summer and then pot them in the fall expecting an abundance of bloom in the winter as well. The plants are weakened by blooming and potting, and do not respond to the care given. Plants intended for winter blooming should not be permitted to flower during the summer at will, but encouraged to make healthy, vigorous, compact plants. Pot them up in ample time for the roots to become active again before transferring to the house.

CLIMBING BRIDESMAID ROSE.—Among tea roses, perhaps no other is so popular as Bridesmaid,—at least of similar color, a clear dark pink, none is more beautiful. A sport has been obtained from it of climbing character, in all other respects being identical with its parent, and like it blossoms freely and continuously. Where the climate will permit, it will prove most valuable as an out-door plant.

THE HARDY FLOWER GARDEN.

THE FIVE BEST HARDY ROSES.—Excluding the ordinary Hybrid Perpetual roses from consideration, the following may be said to be the best selection of five types : Crimson Rambler, *rugosa*, *Wichuraiana*, *setigera* and Harrison's Yellow. The latter is included because of the striking, clear yellow of its flowers, the growth being very ordinary and occasionally unkempt if not pruned and trained judiciously. It is the only fine yellow hardy rose in general cultivation, and it ought to be in every collection. But it is not propagated very largely.

The Crimson Rambler is one of those novelties of great merit which has won its way with marvellous rapidity to the hearts of every flower lover. Every one, nearly, knows of it,

WICHURAIANA ROSES TRAILING OVER A WALL.

NEW SALVIA SPLENDENS, "SILVER SPOT."—Messrs. J. M. Thorburn & Co., are introducing a new variety of the well-known and popular *Salvia splendens*, the leaves of which are spotted with light yellow. The colored lithograph they are distributing reminds one of the *Aucuba Japonica*, a pretty evergreen shrub from Japan. Equally good effects could be had from this novel variety of the *Salvia*.

and it is one of the first of that class of plants to be chosen. It is as hardy as can be, and is adaptable to many uses : First as a porch or pillar vine ; then as a forcing plant ; or it can be grown as a large bush or clump ; trained to a single stout stem and allowed to head—tree-form ; or it may be used as a hedge plant. In any way it is highly satisfactory—except weakly grown. It must have strong canes to perfect fine blooms. That is its nature, and it is only lack of care or improper pruning that makes it otherwise. When in bloom, from a distance the bunched flowers look like some one large red flower, and are very conspicuous.

The Japanese Rose, *rugosa*, is not as well known as the Crimson Rambler, though known for a much longer time ; yet it gives even more general satisfaction, in that it takes care of itself,—requires almost no pruning, and is not troubled by insects—the greatest pest of the grower of hardy roses. Its large single flowers, pink and white, bloom off and on all summer; and the large red hips or seed-pods make the ornamentation of the plant continuous. The foliage is coarse, but neat and attractive, lasting well throughout the summer. There are two double or semi-double varieties of this rose which are practically unknown, though they are not new, and are undoubtedly improvements over the singles. These are Madame Georges Bruant and Comte d'Epremesnil ; the former is white and the latter red. They seem to bloom even more profusely than the type, large bushes being rarely without flowers all summer long. The *rugosa* also makes a good hedge.

The *Wichuraiana* rose is very different from any of the others in this selection, being distinctly a trailing rose ; but it may be trained on a trellis like any other "climbing" rose. Its greatest use is for covering banks, low walls, (see illustration), etc., and for this purpose it is unsurpassed. It grows very rapidly, and will throw out wonderfully long shoots in a season, running right along the ground. As the quantities of single white flowers appear on the bed of shining green foliage, the natural beauty of the plant is intensified, and it provokes admiration from every beholder. Within quite recent years there have been improvements along this line of roses, and there are now "Wichuraiana hybrids" which are really valuable acquisitions. The following briefly describes them : Manda's Triumph.—Perfectly formed double white flowers nearly two inches in diameter, beautifully imbricated. They are in clusters of from 12 to 18 on even small side shoots, literally covering the plant. Universal Favorite.—Soft light pink double flowers, large size and sweet-scented. South Orange Perfection.—Free bloomer, but with smaller, double flowers, white, the tips of the petals soft blush pink, changing to white. Pink Roamer.—Bright, rich pink—a fine color. Flowers single, but produced in large clusters, the individuals being about two inches in diameter. Possibly the showiest of the group. Where a number are used an assortment looks well, or one kind alone may be used. The *Wichuraiana* can also be trained to standard form like the Crimson Rambler, but is too weak to support itself without a stake. The beauty of plants trained in this manner, the long, slender shoots trailing to the ground, and the flowers showing off to excellent advantage, can be well imagined. The foliage remains persistently green through a great portion of the winter, which, with the abundant little red seed pods, make it attractive for a long period. A more recent race of hardy roses termed evergreen has been developed from the *Wichuraiana* crossed with other hybrids. These are Evergreen Gem, Jersey Beauty and Gardenia. It is quite possible that these may prove even more valuable than are the others, which is saying much.

Rosa setigera, the Prairie Rose, appeals very strongly to the writer as one of the most beautiful flowering roses to be seen. The readers of the MONTHLY may remember a colored plate which appeared in its pages some time ago. It is of semi-running habit, making it adaptable for growing singly or as a hedge. A hedge in full bloom is a picture. The older flowers shade off from the natural deep rich color, not in a manner to disfigure the whole, but so as to form a beautiful combination of color. The foliage is not particularly attractive, yet by no means objectionable. This rose is fast winning its way to great popularity, and will doubtless be found generally worthy.

FRUITS AND VEGETABLES.

THE PROFITS OF MARKET GARDENING.—Numbers of inquiries come, to the editors of horticultural and agricultural newspapers, of

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FRUITS AND VEGETABLES.

THE PROFITS OF MARKET GARDENING.—Numbers of inquiries come, to the editors of horticultural and agricultural newspapers, of

INTENTIONAL SECOND EXPOSURE

gardening profits that may be made out of growing fruits and vegetables for market. Much attention is paid to the character of the soil, the climate and the adaptability of varieties to these conditions; but one essential is over all, and that is the marketing of fruits and vegetables after they have been raised. Even when there are markets convenient, a person may be wholly ignorant of the methods of marketing. It takes nearly as much art to know how to sell as it does to know how to raise the article in the first place. In brief, the success of any proposed market garden plan depends as much on the man himself as on the natural conditions of soil and climate.

BARTLETT PEARS.—Eastern markets were abundantly supplied with Bartlett Pears, from California, last season, in advance of the crops in the Atlantic States, and brought very good prices. They were of very good quality.

PEACH-GROWING IN THE SOUTH.—Mr. J. Van Smilley tells the *Southern Farm Magazine* that:—"The leading family and market peaches originated in the South, and were introduced by Southern nurserymen. The Sneed peach, the earliest of all, ripening ten days ahead of the old Alexander, originated near Memphis, Tenn. The Greensboro peach, an extra large early variety, ripening with Alexander, originated at Greensboro, N. C. The Triumph, the earliest yell w peach ever known, ripening only one week after Alexander, originated in Georgia, as did the Elberta. One of the finest table and market peaches, the Lady Ingold, which has attained a national reputation, originated in Guilford County, North Carolina, and was introduced by the writer. The Connetts Early originated in this county, and is fast attaining a national reputation. The introduction of these varieties has caused the South to become one of the leading peach-producing sections for market in the Union."

SEEDLESS GRAPES.—Grapes often produce berries without seeds in them. Once in a while, an individual will produce all the bunch with every berry seedless. Propagated by cuttings, it is then distributed as a distinct variety. The variety, known as Black Corinth, gives us the currant of European commerce. The Sultana is a variety that gives us the currant of California. Another has been raised in California, known as Thompson's Seedless. It is becoming very popular there.

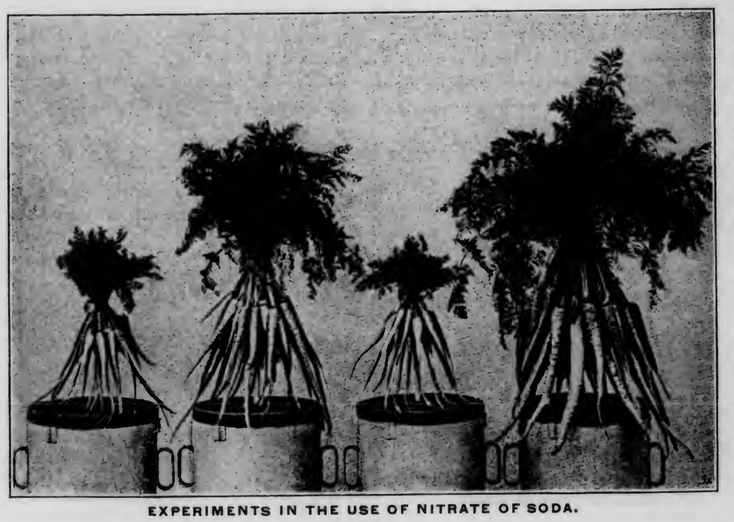
CHOICE HOME FRUIT.—I want to refer to a fruit which every citizen may cultivate, for it will climb a fence or an alley wall. I mean the grape, and one of the most wholesome of fruits, and the vine is so cheap and will so early yield fruit, that even the tenant may well plant it in his back garden. A vine each of the following would give a succession of delicious grapes for the table from September 1st until Christmas, or even longer. I name them in the order of ripening: Moore's Early, Lady, Lindley, Wilder, Delaware, Diamond, Salem and Vergennes. The last two varieties might be kept well into the winter for table use. There is no secret about keeping them in good condition, except a moderately low temperature and in moderately humid air, or wrapped in oiled paper. If the cellar is warm and dry they will shrivel up.

The cherry is well adapted to the city fruit garden. The tree is ornamental in habit and in bloom, and the fruit both attractive and marketable. The fruit cannot always be purchased in the market at its best; like the peach and the plum it is most luscious when gathered from the tree at the nick of time, when it is just at its best. The market gardener picks his cherries on the green side, and they do not improve after gathering, so you seldom get them at their best from the green-grocer. The cherry must have sandy soil for the best success, but whatever soil, it must be dry. If not too close in texture, it will not need much cultivation, so you can plant the cherry along the border, if you choose, but, if the ground is hard, you must either dig about the trees or mulch them well. For a succession I would plant Governor Wood, Black Tartarian, Napoleon, Early Richmond, May Duke, Montmorency, Elkhorn, Windsor and English Morello. The cherry does not need much pruning. Indeed, if you cut it very much, you will injure its vitality. There is no fruit more profitable, and a small garden planted with cherries will give you good returns.

Strawberries you want fresh from your own vines to have them at their best, and you cannot always depend upon your fruiterer for them. They will repay the highest cultivation, and give wonderful yields of fruit. Try Clyde, Bubach, Saunders and Haverland, or some of the other highly recommended varieties, and see how well you will be repaid.

L. WOOLVERTON,
Before Hamilton (Ont.) Horticultural Society.

NITRATE OF SODA.—A correspondent recently inquired about the use of Nitrate of Soda in the culture of lettuce under glass. There seemed to be no American experiments at hand. The horticultural journal, *La Semaine Horticole*, is giving a series of papers on the subject, detailing experiments on various kinds of garden vegetables, made at Darmstadt, by Professor Paul Wagner, by which it appears that when in connection with other materials, it is of great advantage. Annexed is an illustration of carrots, grown under these experiments, given in that magazine. The results are truly surprising.



EXPERIMENTS IN THE USE OF NITRATE OF SODA.

For a little less than 100 feet, 2¼ lbs. of Nitrate of Soda was applied at the commencement of the growing season, and 2¼ a month afterwards. About 14 lbs. of super-phosphate, and the same of potash, was applied with the first dose of the nitrate.

APPLE, ROME BEAUTY.—Apples, as fruit growers know, have their special likes and dislikes to various localities. Reports from parts of Nevada indicate that the Rome Beauty considers itself comfortably at home there, and is popular with orchardists.

STATE HORTICULTURAL ASSOCIATION OF PENNSYLVANIA.—The Forty-first Annual meeting of the State Horticultural Association of Pennsylvania was held at Pittsburg, January 16th and 17th. That it was a most interesting, instructive and well attended meeting, was unanimously agreed by those in attendance. Strange to say, through the long period of its existence this occasion marks the first visit to any city west of the Allegheny Mountains, and partly accounts for its existence being comparatively little known among the vast number of Pennsylvania horticulturists. Prof. John Hamilton, Secretary to the State Board of Agriculture, states that the Department has a list of 30,000 Pennsylvanians interested in fruit growing! Add to this those interested in farming alone, (possibly only one per cent. of the fruit-growers do not farm also), those interested in floriculture, gardening and the various allied lines, and we have a multitude of men who might be benefited through membership in this organization. The friendly intercourse of its members is perfect; they gather together for the advancement of horticulture, which means not the hoarding of secret information but the free interchange of thought and advice—the best that the most practical experience can give. Fruit-growing is the most popular topic at these meetings, for, naturally, the majority of its members are fruit-growers; yet other things are not neglected.

One would suppose that forty years' diffus-

sion of such practical information, as comes before these meetings, would ere this have put Pennsylvanian fruits at least in the front ranks among the best fruit-growing States; yet it is shown to be little beyond its infancy, though fruit of finest flavor can be produced there. Many persons fail to realize this fact, that location has considerable to do with the quality of fruit,—and in this respect Pennsylvania is favored. Great need is shown for thoroughness in orcharding from first to last. Lacking this, the trees are unproductive, and have not the vitality and energy to make long-lived orchards; the fruit is frequently undersized, worm-eaten, scabby and devoid of natural color; and, lastly, the products are marketed in a slip-shod, unattractive manner. It would require many pages to detail the proper care of orchards, but there are some points of chief value that should always be kept to the fore, and they can be as profitably adopted by the owner of a few door-yard trees as by the proprietor of a 300-acre orchard,—a fruit tree is a source of desirable production in either case; let us have the best it can yield. Taking the larger fruit trees for illustration of needed attention, such as the apple, pear, peach and plum, the soil should be well prepared to receive the trees—the sub-soil broken up (not turned up); healthy, vigorous trees should be planted, and planted carefully by bringing the soil into perfect contact with the roots, as often related in these pages; the trees must have plenty of room for future development—they wont give good satisfaction for all time without light and air among the branches, for which reason a careful guidance, by aid of the pruning-knife, is also necessary; the maintenance of food in the soil must be regularly provided for, and this means those fertilizers supplying nitrogen, phosphoric acid and potash at least. These fertilizers become soluble in water, therefore a supply of moisture must be maintained—not necessarily nor preferably by rain or artificial means, but rather by conservation through constant cultivation, dating from the time the plants are set out.

Among other interesting matters presented at this meeting may be mentioned a review of floriculture in Allegheny County, showing its advancement the past forty years, by Mr. P. S. Randolph, a successful florist of Pittsburg. Mr. Randolph's capable discourse took his hearers thoroughly along the course from the time when there were but two greenhouses in the whole country, and camellias were almost the sum and substance of the florist trade, and the capacity of a florist's business was reckoned by the number of camellias he possessed, through the periods of changes in plants and flowers, and methods of heating.

The Hon. Alva Agee, of Ohio, had an appreciative audience for his practical talk on potato culture, on which he is an acknowleged authority. Two important recommendations he made were the use of true second crop seed potatoes, small perhaps, but produced in strength, and deep planting with shallow covering, the soil being added as the sprouts grow. The benefit to the potato plants by the latter method, in having the roots near the light and air as long as possible, is evident to every reasoning person; but it is not every one to whom it would occur.

The chief speaker for "Ornamental Horticulture" was Mr. Wm. H. Moon, the well-known nurseryman, and ex-president of the association.

The next annual meeting is to be held at Harrisburg. Annual membership fee $1.00; life-membership, $10,00.

AMOUNT OF SEED REQUIRED FOR VEGETABLE PLANTS.—The following useful table is taken from the valuable catalogue of Mr. Alfred Bridgeman, and will be a guide to those who do not know just what quantities are required in ordering:—

Cabbage,	1 oz.	3,000 plants.
Cauliflower,	1 "	3,000 "
Celery,	1 "	4,000 "
Eggplant,	1 "	2,000 "
Endive,	1 "	3,000 "
Lettuce,	1 "	4,000 "
Pepper,	1 "	2,000 "
Tomato,	1 "	2,000 "
Pole Beans,	1 qt. to	150 hills.
Corn,	1 "	200 "
Cucumber,	1 oz. to	50 "
Watermelon,	1 "	30 "
Muskmelon,	1 "	60 "
Pumpkin,	1 "	40 "
Early Squash,	1 "	50 "
Marrow Squash,	1 "	30 "
Asparagus,	1 "	60 ft. drill.
Beet,	1 "	50 "
Carrot,	1 "	150 "
Okra,	1 "	40 "
Onion,	1 "	100 "
Onion Sets, Small	1 qt. to	50 "
Parsley,	1 oz. to	150 "
Parsnip,	1 "	200 "
Radish,	1 "	100 "
Salsify,	1 "	70 "
Spinach,	1 "	100 "
Turnip,	1 "	150 "
Peas,	1 qt. to	100 "
Dwarf Beans	1 "	100 "

Mr. Bridgeman has taken pains to make his catalogue as useful as possible to the amateur, and among other hints, designates those varieties which are recognized superior to others.

A SELECTION OF VEGETABLES FOR A GIVEN SPACE.—In response to the inquiry of a Kentucky correspondent, Messrs. D. Landreth & Sons give the following list of seeds desirable and in sufficient quantities for a strip of ground 40 x 30 yards:—

BEANS.—Stringless Green Pods,	1 quart.
Landreths' Scarlet,	1 quart.
Kentucky Winter Pole,	1 pint.
CORN, SUGAR.—Country Gentleman,	1 pint.
Landreths',	1 pint.
CUCUMBERS.—Emerald,	2 ounces.
BEETS.—Columbia,	4 ounces.
CABBAGE.—Wakefield,	½ ounce.
Redland Early Drumhead,	½ ounce.
CARROT.—Ox-Heart,	1 ounce.
St. Valery,	1 ounce.
CELERY.—White Plume,	1 ounce.
LETTUCE.—Landreths' Forcing,	½ ounce.
Bloomsdale Reliable,	½ ounce.
Landreths' Early Summer,	½ ounce.
Landreths' Largest of All,	½ ounce.
EGG PLANT.—Landreths',	½ ounce.
MELONS, WATER.—Arkansas Traveler,	1 ounce.
Bradford,	1 ounce.
MELONS, CANTALOUPE.—Early Bristol,	½ ounce.
Anne Arundel,	½ ounce.
Missouri,	½ ounce.
Black Paris,	½ ounce.
OKRA.—Landreths' Long Green Pod,	1 ounce.
ONIONS.—Bloomsdale Pearl,	1 ounce.
Bermuda White Wax,	1 ounce.
ONION SETS.—Silver Skin,	2 quarts.
PARSLEY.—Emerald	1 ounce.
PEAS.—Landreths' Extra Early,	2 quarts.
Bloomsdale,	1 quart.
Duke of Albany,	1 quart.
Phonograph,	1 quart.
RADISH.—Scarlet Prussian Globe,	1 ounce.
Wonderful Half-long Scarlet,	1 ounce.
Long White Lady-finger,	1 ounce.
TOMATO.—Ten Ton,	1 ounce.
Beverly,	1 ounce.
Stone,	1 ounce.

SHELTER-BELTS AND WIND-BREAKS. — In certain localities where winter winds are extremely severe, and snow-falls heavy, it becomes necessary to protect trees of some kinds from damage. Prof. C. B. Waldron, of the North Dakota Experiment Station, has the following to say regarding the use of willows for this purpose:

"The subject of snow is a serious one in connection with tree planting, and the destruction wrought by it has quite discouraged some who had beautiful and thrifty groves. This is because their trees were not arranged properly. In years of very heavy snows of course some damage will be done, but if a single row of willows be planted parallel with the north side of the grove and about ten rods from it, the drift will lie between the willows and the grove, and the trees escape serious injury. The trees at this station are protected in that manner, and in the winter of '95 and '96 our only injury was to some low, bushy plum trees, while other groves were nearly destroyed. The intervening space, when trees are planted in this way, may be utilized for small fruits and general gardening. For these operations it is very desirable to have protection from the south winds in the summer, and a good covering of snow in the winter.

The belt of trees itself should be of good width, if we are to get the conditions found in the forest. The minimum width should be four rods, while a strip twice as wide is better. Around the outside of this belt another row of willows should be planted. The White Willow is generally used and found satisfactory, but with us the Golden Russian Willow grows faster and is more ornamental. The Laurel-leaved Willow is scarcely inferior to this, and has a beautiful foliage. Within the tree belt come the permanent trees, such as are to give lasting charm and protection to your abode and your children."

Besides the willow, Prof. Waldron recommends the cottonwood (poplar) in single rows, the box-elder (*Negundo*), Soft Maple (*Acer dasycarpum*) where soil is not too dry and the practice of cultivation is followed. Belts three rows deep are planted,—say two of box-elder with some larger growing, permanent tree for the center row. For the latter, White Ash is recommended where not troubled by the bark beetle; American Elm; *Quercus macrocarpa* (Bur Oak); hackberry (*Celtis*); basswood (linden); and Rock Elm.

"As we reach the opposite side of our timber belt, smaller and more graceful trees with rich, heavy foliage should be used to give the proper ornamental effect. The grove should not break off grim and harsh exposing the bare trunks of the trees, but should blend itself into the landscape through the easy stages of birch and choke-cherry (*Cerasus Virginiana*), with still smaller shrubs at the last. These give a much better effect on the margin if not confined to straight rows."

It will be seen by the closing of the preceding paragraph that Prof. Waldron is an advocate of beautiful natural surroundings, even when it comes to making shelter belts,—and in this he is perfectly right. It takes but little more effort and expenditure of money to make a place attractive and a home in every

sense. The question of "How shall we keep the boys on the farm?" would seldom need to arise if the farm were less bare and attractive in its outward surroundings as well as indoors.

BIOGRAPHY AND LITERATURE.

GREEN FIELD MEMORIES.

—— music such as yields
Feelings of old brooks and fields,
And, around this pent-up room,
Sheds a woodland, free perfume,—
O, thus forever sings to me!
O, thus for ever!
The green, bright grass of childhood brings to me,
Flowing like an emerald river,
And the bright-blue skies above!

LOWELL.

THE SHAMROCK. — The plant (*Trifolium minus*) is the generally accepted Shamrock of Ireland, but old authorities believe that the original Shamrock is the Wood Sorrel (*Oxalis Acetosella*). An early writer (Sir Henry Piers) says: "Between May Day and harvest, butter, new cheese, curds and Shamrocks, are the food of the meaner sorts." Now Wood Sorrel is an agreeable salad herb, whereas Clover or Trefoil, which is usually considered as the Shamrock, is anything but palatable. Then Fynes Morrison writes of his countrymen: "They willingly eate the herbe Shamrocke, being of a sharpe taste,"—a description applicable to the Wood Sorrel, but not to any species of *Trifolium*. Moreover, the Clovers never grow in woods, whereas the Wood Sorrel has there its native place, and coincident with this the "Irish Hudibras" states:

"Within a wood, near to this place,
There grows a bunch of three-leaved grass,
Called by the boglanders Shamrogues,
A present from the Queen of Shoges (spirits)."

These authorities, we think, justify the conclusion that originally the Wood Sorrel was the Shamrock of ancient times.—*Journal of Horticulture.*

DOUKHOBORS.—May I call your attention to a mistake on page 32 of the February MONTHLY? The writer of the paragraph "Indian Civilization" speaks of the Doukhobors as if they were North American Indians. As a matter of fact, they are a sect of Russian Christians,—vegetarians, socialistic and opposed to war—whom persecution at home has driven to more congenial surroundings. They began to arrive in the Canadian Northwest about a year ago,—having been enabled to get away from Russia through the efforts of members of the Society of Friends, both in England and America.

C. F. SAUNDERS.

Mr. S. will accept thanks for the correction. The paragraph was made up from a long report of a Canadian department, and the condenser evidently supposed it referred to an Indian tribe, as the habits described were, in so many respects, like those of some of the Northwestern Indians.

GENERAL NOTES.

TEAK, BRIAR PIPES, AND MISTLETOE.—Dr. C. W. Greene notes.—*Mistletoe* (p. 168).—"Directions for the artificial propagation of the Mistletoe are given in Henderson's Handbook of Plants. Press a berry on a crack in the bark, and tie oiled paper over it.

Briar Pipes.—Your correspondent states (p. 165), that briar pipes are from smilax roots. But the briar pipes of commerce are from *Erica arborea* of Europe.

Teak.—It is stated that some of the Philippine Islands abound in forests of that noble and interesting tree, *Tectona grandis*. It is, therefore, probable that before many years we shall all become familiar with its wood.

HISTORIC SAGO PALMS. Transfer of Historical Plants.—By the death of the late Mrs. C. Van Rensselaer Thayer, of Lancaster, Mass., three large plants, that have long been in her greenhouse here, have lately been transferred to the New York Botanical Gardens, under the supervision of Mr. S. Henshaw.

One, a *Cycas revoluta*, is known to have been in the Van Rensselaer family for over a century, being brought from their homestead, near Albany, when it was demolished. It is a superb specimen, and will have an historic interest to the Botanic Gardens of the State of New York.

Two large *Agave Americana* were also sent with the *Cycas*. They are huge plants, larger than some that have reached maturity and flowered. These also have a similar history to the *Cycas* above noted. E. O. ORPET.

TRILLIUM CERNUUM.

AMERICAN HERB-PARIS.

NATURAL ORDER, LILIACEÆ.

TRILLIUM CERNUUM, Linnæus.—Leaves broadly rhomboid, acuminate, subsessile; flowers pedunculate, pendulous, white. Stem nine to fifteen inches high. Leaves three to five inches long, and two to four inches wide. Peduncle half an inch to an inch in length. Berry half an inch to near an inch in diameter, fleshy, dark purple when mature. Darlington's *Flora Cestrica* as *Trillium pendulum*, Muhl. See also Wood's *Class-book of Botany*, Gray's *Manual of the Botany of the Northern United States*, Chapman's *Flora of the Southern United States*, and Britton & Brown's *Illustrated Flora of the Northern United States, Canada and the British Possessions.*

This pretty and interesting wild flower brings us, as Herb-paris, into close relation with classical floral literature of the Old World. The original Herb-paris of Europe is, botanically, *Paris quadrifolia*. There is very little difference between *Trillium* and *Paris*. The former, as the name implies, has its various parts arranged in threes,—while the latter, as again exemplified by its name, has them in pairs. But these differences arise only from the abortion of parts primordially the same. Specimens of *Trillium* are occasionally found with more than three leaves, sepals, petals, and the usual six stamens,—while *Paris*, with its two-pair (four) leaves has been found with but three, as in *Trillium*. Some modern American botanists have adopted the common name of "Wake-robin" for the American plants,—notably Britton & Brown. This is unfortunate, as it not only disturbs the popular relationship of our plant with the historical associations connected with *Paris*, but confuses distinct things. Wake-robin is the common name in England for the *Arum maculatum*, a very different plant.

One of the common names in the Old World is Herb-true-love,—and it is around this name that the poetical associations of *Paris* cling. The two pairs of leaves are set cross-wise, and make a verticil of four, resembling a Saint Andrew's cross, or "true-lover's knot." The association with love stories and love affairs may not have wholly originated by the arrangement of the leaves,—the erroneous employment of the capital P in *paris* gave a tinge of personality to the whole idea. It is in actual use as emblematic floral language in Germany. Our plant, the *Trillium*, with its verticil of three instead of four leaves, might well stand as an emblem of love, wit and valor, in which Moore has enshrined the Shamrock, —especially as there is so much dispute as to what plant was the Shamrock's original.

Says Valor, "See
They spring for me,
These lovely gems of morning."
Says Love, "No, no,
For me they grow,
My fragrant path adorning."
But Wit perceives
The triple leaves,
And cries, "Oh! do not sever
A type that blends
Three God-like friends,
Love, Valor, Wit for ever."

Rafinesque, indeed, tells us that in some parts of our country, one of the common names of the *Trillium* is Indian Shamrock. Botanical writers, in selecting popular names to go with the botanical ones, seem to follow no rule, and the name of American Nightshade frequently follows *Trillium*. This has the merit of carrying us back to the early botanical history of the family, for the early botanists, Gesner and Lobel, supposed it to belong to the Nightshade family, and named it *Solanum tetraphyllum*. It was, however, Herb-paris so far back as Gerarde's time. In his Herbal, published in 1636, he tells us that "the Herba-paris flowreth in Aprill, and the berry is ripe the end of May;" and he says "Herbe Paris is exceeding cold; whereby it represseth the rage and force of poyson. The same is ministred with great successe unto such as are become peevish, or without understanding."

COLOR PLATE

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COLOR PLATE
INTENTIONAL SECOND EXPOSURE

Coming to the botanical history of our species, *Trillium cernuum*, it may be noted that considerable confusion exists as to the limits of the species. They vary very much among themselves, and it is often difficult to determine to which species a given form belongs. Rafinesque tried to solve the difficulty by making species of the various forms. In this way he names thirty-four that he thought worthy of specific rank, many of them established by himself. The one which is here illustrated, and which is the common form in Eastern Pennsylvania, he describes as *Trillium glaucum*, referring to the figure No. 40, in Barton's "Flora of North America," as his type. He contends that it is not *T. cernuum* of Linnæus. Darlington, from whose work the main description is taken, is of the same opinion, but refers it to the *Trillium pendulum* of Muhlenberg. The *T. cernuum* of modern botanists, he would have as *Trillium medium*, Rafinesque. These distinctions are not recognized now, and the latest work, Britton & Brown's "Illustrated Flora," issued in 1896, still has *Trillium cernuum*, L., under which name our plant will have to be sought in that work.

With all allowance for the known variations in the species of this genus, it may come that this plant will be found distinct from *T. cernuum*, and Muhlenberg's name of *T. pendulum* be adopted. The long, narrow and recurving petals, and the broad, five-veined glaucous leaves—points well brought out by Rafinesque—are uniform in the plants of the whole territory, and well characterize the plant at a glance. A comparison of our plate with the drawing in Britton & Brown's work shows a striking difference in the root-system. In making drawings for our work, it was the practice not to refer to the drawings of the same plant already published by others, so that the artist might not be diverted from following nature just as presented in the specimen before him. It was pleasant to note, on a subsequent comparison with Barton's figure, already referred to, that they agreed in every particular. Our specimen includes the root, which Barton's did not. As it is the scope of this work to illustrate the works of the standard authors on American botany quoted at the head of the chapter, the designation of our plant as *Trillium cernuum* has been followed, though the author feels that it should occupy a place in systematic botany, as *Trillium pendulum*, Muhlenberg.

The botanical student, who may have come to the conclusion that Science is a statement of exact and well-ascertained facts, can well be excused for standing aghast at the differing statements in regard to what is or is not a species in the genus *Trillium*,—and to the disagreements as to what are the proper names by which to distinguish them. It is said that what is or is not a species, is simply the opinion of an expert,—and that there really is no such a thing as species in nature.

But this would remove botany from its position as one of the sciences. There must be something of the character of species in nature, or there could be no classification. It would never do to believe that a science could not exist, but fortunate entrance into the world of a few individuals. It is better to conceive that the definition of species needs a reorganization. As to the opinion of experts their views of the limits of species in *Trillium*, and what name should be adopted take a wide range. One would surely regard the opinions of the Kew authorities as the opinion of experts, considering their immense Herbarium. Again, Britton & Brown would be regarded as experts of the highest order in America. Yet the latter contend that *Trillium erythrocarpum* should be dropped,—while the former insist that it should be retained!

Trillium cernuum has a wide range. Britton & Brown say that it is found in rich woods, Nova Scotia to Ontario and Minnesota, south to Georgia and Missouri. The form, herewith illustrated, grows abundantly in the more shaded parts of rocky woods along the Wissahickon, and is common in similar situations throughout Eastern and Southern Pennsylvania, Maryland and Virginia. It is more at home among broken rocks, where leaves of trees can be collected and decay. One of its favorite companion plants in these situations is the May Apple, *Podophyllum peltatum*. The habits of these plants are indeed similar, though their botanical affinities seem remote.

There are about fifteen good species of *Trillium*. They are spread over the whole of the temperate portions of North America and Asia, including Japan.

EXPLANATION OF THE PLATE.—A full-sized specimen, from the Wissahickon, near Philadelphia.

WILD FLOWERS AND NATURE.

SPRING.

The silent quickening of the pulse of life,
The sweet awakening from the long, cold sleep,
The gentle soothing of wild winter's strife,
And the dripping music of the water's leap.

A tender green, transforming barren trees,
A thrill of love that warming sun rays bring,
A joyous bird-note borne along the breeze,
And, lo! the glorious advent of the spring.

—

A constant quickening of the pulse of hope,
A sleepless trust and strength to do life's best,
A power of sympathy and love to cope
With all that tends to make life seem unblest.

Such earnest souls that know no faltering,
But light with cheer the darkest pathway trod,
Awake each day in Love's perennial spring,
And live immortal in the life of God.

BERTHA MORTON HOWLAND,
in *Christian Register*.

ANGELICA HIRSUTA AND YELLOW BIRCH.—Mr. Harlan P. Kelsey says in reference to the note on *Angelica hirsuta*, on page 20, of MEEHANS' MONTHLY, that few who have seen the two plants growing would agree with Dr. Gray's opinion that there is little difference between them. He also notes that the Yellow Birch is found for at least two hundred miles south of Blowing Rock.

LEGAL PROTECTION TO WILD FLOWERS.—A daily paper says: "The Connecticut Legislature, some time ago, passed a law protecting the trailing arbutus, said to be the first law ever passed in any State of the Union for the protection of a wild flower. The law in question is said to be largely due to an article in the New York *Tribune*, calling attention to the need of a law to protect the arbutus." This is, maybe, a law really intended to protect the *Epigæa;* but it may be in the line of the protection the same legislature gave to the "Hartford" Fern, *Lygodium palmatum*, which proved to be a law to enable owners of waste land to root out the plant for their own personal profit, than to permit the wild flower lovers to enjoy what generous Nature offered them.

THE WINDFLOWER AND THE VIOLET.—Among the pleasantest recollections of rare findings in my botanical experience is that of my collection of the Windflower (*Anemone nemorosa, L.*), with perfectly double, pure white flowers, quite a little "*daisy*" of a blossom, or perhaps more nearly resembling the diminutive Polyantha Rose, "Little Pet," though rather smaller. These flowers were apparently perfectly full, exhibiting no imperfect centre. The height of the plants was about four inches; and the leaves were very much smaller and more refined than those of the ordinary specimens with single flowers. Its habit was tufted and so different in aspect throughout that I was quite puzzled at first what to think of it; but after careful examination, I was convinced (a little against my will, too) that it was a modified, exquisitely perfected *Anemone nemorosa*.

It is no common experience of a botanist to find a double wild flower, and I can assure you there was a very pleasant "humming in the tissues" on this occasion. The plants grew (I think there were three of them close together) among numerous individuals of their kindred, with ordinary flowers and leaves, in an open grove on the slope of the bluff at Fort Madison, Iowa.

As though this rare treasure-trove was insufficient, I later on found, higher up on a sunny slope facing the south, what seemed a veritable garden of the fairies. Among the tufts of short grass grew fifty—perhaps a hundred—plants of the beautiful *Viola pedata var. bicolor*. Certainly, the Bird's-foot Violet, in its ordinary garb of turquoise blue, with handsome, divided leaves, is a very charming thing; but in what fitting terms could one describe that elegant variety *bicolor*, when seen for the first time, and, as it were, planted by invisible hands in a circumscribed sort of oasis on such a hill slope!

It certainly was a great surprise for me again. These royal members of the species, clothed in deep violet above, contrasting so

finely with the beautiful light forget-me-not blue of the lower petals, were well surrounded by an assemblage of courtiers of the ordinary type. I shall never forget that pretty sight. And this pansy-like violet, so remarkably varied from the type, was simply a *wild flower*, unmodified by the florist's art. It seemed almost impossible.

The variety *bicolor* of *Viola pedata* is mentioned in Gray as sparingly present in Massachusetts, Maryland, etc.; but I have not seen it credited to Iowa, and I never happened to meet it elsewhere in the West. Enough now, perhaps more *anon*. H. A. W.

CYPRESS KNEES.—"Mr. H. J. Webber, in the U. S. 'Year-book of Department of Agriculture,' 1896, states that, when grown in a dry soil, the Bald Cypress forms no knees. But there stands, in Lynwood Park, Camden, N. J., a Bald Cypress, in an open situation, and in a comparatively dry spot, not very near any water. The ground near it is covered with miniature knees. It is well worth a visit." G.

Many instances of the Deciduous Cypress throwing up its curious bee-hive-like "knees," when growing in ordinary ground, have been recorded in horticultural journals,—a source of information not as often resorted to as it might be.

LIATRIS.—Few flowers, wild or cultivated, are more attractive than those of several species of *Liatris*, or "Blazing-stars," as they are very generally known, and we may look upon them with increased interest, because of their adaptability to cultivation. It is not the color which is so pleasing, for many persons tire of purple or lavender shades; but the bold spikes of flowers, and the long blooming period, make them conspicuous and attractive. Perhaps it is not right to bring up the color question, as in this case it is seldom objectionable,—in fact, there is frequently a generous shading off to nearly white, making a pretty combination.

The principal species are *pycnostachya*, *spicata*, *scariosa* and *punctata*. The latter is possibly the least familiar of this group, but being a pretty little thing should not be neglected. It has quite narrow leaves, very unlike the preceding, and is of lighter growth in every way, attaining a height from six inches to two feet. While traces of punctation (tiny dots, as if perforated) are found in most of the species, this is markedly punctate, sufficient to give it the name *punctata*. *L. acidota* very closely resembles the former, but is much less punctate and comparatively glabrous throughout. This species, however, is almost confined to Texas, while *punctata* may be found as far north as Minnesota. The composite flower-heads of both contain from three to six flowers only, adding to the slender appearance, and correspond in numbers to *pycnostachya*. By means of a pocket magnifier, the pappus (thread-like attachments to the flowers) will be seen to be beautifully feathered, while the others are but slightly barbed. The flower-heads are crowded, sessile and tubular, interspersed with a few shortened leaves.

Pycnostachya, to some extent, is not unlike the foregoing; but it is of much bolder growth, frequently reaching five feet in height. Spikes are dense, thick and slightly bracted; heads numerous, sessile and cylindrical. But it can always be distinguished from them by the barbed pappus and broader lower leaves. It runs through the same region.

In turn, *pycnostachya* approaches *spicata*; yet there are several distinctive features. The latter has more flowers—seven to fifteen—in each head; the scales at the base of the heads are very blunt or obtuse; and the heads are broader and inclined to be globular. The spikes are long and without leaves; the heads sessile, giving a stout appearance. It grows on prairies and in moist soils, throughout the Atlantic Coast States, extending to the species in the central States.

Comparing *scariosa* with the smaller species first described, they are totally different, and it is therefore wisest to show its distinction from *spicata*. The large flower-heads with stems, or peduncles, are marked. The number of heads in the raceme varies greatly from five to twenty, and the flowers in a head from twenty to forty. It will be seen from this that a specimen well furnished with flowers and heads would present a very attractive appearance. The scales are somewhat obtuse. It has a wide range, from Canada to Florida to Texas and Western Ontario, growing in dry woods and sandy plains.

For planting singly or *en masse* in herbaceous borders and shrubbery beds, these plants will be found invaluable and easy of cultivation.

GENERAL GARDENING.

THE SPRING AWAKENING.

"Dost thou not rejoice
When the spring sends forth an awakening voice
Through the young woods? Thou dost! And in that birth
Of early leaves and flowers, and songs of mirth,
Thousands, like thee, find gladness!"

MRS. SOUTHEY.

WIND-BREAKS AND SHELTER-BELTS. — Besides the damage to trees in heavy falls of snow, and accumulation of ice, as spoken of in the March issue, there is even greater damage done to trees generally by the strong winds. The air always sucks up all the moisture it can from everything until it contains equally as much as the article from which it is drawn. The drying of clothes on a line is an example. The air takes up the moisture from them; and the stronger the wind, the more quickly they dry. Trees are drawn on in the same manner, evaporation, as we know it, taking place from the leaves as well as the wood in summer. As a rule, the most severe tax on the trees is in the winter, when the roots are not actively engaged in replenishing the supply of moisture, and when winds are usually most severe. It is then that the trees most exposed to these winds are frequently killed. Of course, many trees are also lost during a hot and dry summer, for heat takes up moisture wherever it can be had, even more rapidly than wind,—all on the same principle; but, as stated, the trees then have a support in the active roots.

Naturally, most evergreens are less responsive to the demands of the heat and winds, by reason of their resinous character and the closer texture of the bark, hence they are frequently found most suitable for very bleak situations. They make admirable wind-breaks and shelter-belts, with careful selection as to kind. On the grounds of Mr. Josiah Hoopes, West Chester, Pa., there is a magnificent belt of Norway Spruce, probably not less than forty feet in height, which affords great protection to a number of trees thus partly enclosed. These spruce are thick and well-branched right to the ground, making a practically impenetrable wall. But Norway Spruce will not stand the most severe locations. Mr. C. S. Harrison, York, Neb., recommends Red Cedar, Ponderosa Pine, Platte Cedar and Colorado Blue Spruce. The latter would be an expensive thing for the purpose, but a beautiful one,—and why not combine beauty and utility! The Platte Cedar is Mr. Harrison's favorite, and he says of it: "It will endure any climatic change, and for ages has borne the extremes of drought and flood, hot winds in summer, and winter blizzards. Properly grown, it will transplant as easy as an Elm or Box Elder, and will grow nearly as rapidly. For a ten-acre lot, I would put out two rows, eight feet apart; put the trees eight feet distant in the rows and break joints. One row of Cedar and one of Ponderosa would make a fine shelter-belt."

The idea of shelter-barns for cattle in the open fields, formed by planting evergreens, is an excellent one, both for summer and winter protection — for in many places cattle are obliged to winter outdoors as well, where infrequency of wet storms makes it possible. They can be made at reasonable cost, and it would be a more certainly humane treatment of the animals. Mr. Harrison thus describes the method of planting for this purpose: "Plant three rows of Platte Cedar eight feet apart each way. As the trees get size, trim off the lower limbs, save on the two rows outside, so the cattle can go under them. Cultivate well for five years, and you can turn in your cattle." He says the cattle should not be allowed in the shelter-yard in summer, and in this he is probably right, as the constant tramping of the soil would harden the surface to the injury of the trees. The manure should be hauled out and the ground plowed. Another shelter might be started to be used in alternate years, which would make them more lasting. "An evergreen barn can be made exceedingly beautiful. The outside row can be of Silver Cedar from

the Rockies, which is as hardy as the Platte Cedar. Outside of this, if you wish, you can put a row of *Picea pungens*, or Blue Spruce, which is the most beautiful tree on earth. One hundred dollars will make a fine evergreen barn, which will be of great use as well as an ornament."

SOME TREES AND SHRUBS OF EXTREME HARDINESS.—(Continued from March issue.)

Robinia hispida.
Robinia Pseudacacia.
Robinia viscosa.
Rosa Carolina.
Rosa cinnamomea.
Rosa lucida.
Rosa microphylla.
Rosa multiflora Japonica.
Rosa rubiginosa major.
Rosa rugosa.
Rosa rugosa alba.
Rosa rugosa flore plena.
Rosa spinosissima picta.
Rubus odoratus.
Salix alba Britzeusis.
Salix alba vitellina.
Salix Babylonica.
Salix lucida.
Salix pentandra.
Salix purpurea.
Salix viminalis.
Sophora platycarpa.
Spiræa arguta.
Spiræa sorbifolia.
Spiræa Thunbergi.
Spiræa tomentosa.
Spiræa Van Houttei.
Symphoricarpos orbiculatus (vulgaris).
Syringa Amurensis.
Syringa Chinensis.
Syringa Emodi.
Syringa Japonica.
Syringa Josikæa.
Syringa oblata.
Syringa Persica.
Syringa villosa.
Syringa vulgaris.
Syringa vulgaris alba.
Syringa vulgaris alba grandiflora.
Syringa vulgaris Charles X.
Syringa vulgaris Ludwig Spath.
Syringa vulgaris Marie Legraye.
Tilia Americana.
Tilia argentea novæ.
Tilia dasystyla.
Tilia platyphyllos.
Ulmus Americana.
Ulmus campestris.
Vaccinium corymbosum.
Viburnum dentatum.
Viburnum Opulus.
Viburnum Opulus nanum.
Viburnum prunifolium.
Viburnum Sieboldi.
Vitis (Ampelopsis) quinquefolia.
Yucca filamentosa.

Abies (Picea) balsamea.
Abies (Picea) concolor.
Abies (Picea) concolor violacea.
Abies (Picea) nobilis.
Abies (Picea) nobilis glauca.
Abies (Picea) Nordmanniana
Abies (Picea) pectinata.
Cupressus Nootkatensis.
Gingko biloba (Salisburia adiantifolia).
Juniperus Chinensis.
Juniperus communis.
Juniperus Sabina.
Juniperus Virginiana.
Juniperus Virginiana glauca
Larix Europæa.
Picea (Abies) alba.
Picea (Abies) Engelmanni.
Picea (Abies) excelsa.
Picea (Abies) excelsa inverta
Picea (Abies) excelsa pyramidalis.
Picea (Abies) nigra Doumetti
Picea (Abies) orientalis.
Picea (Abies) polita.
Picea (Abies) pungens.
Pinus cembra.
Pinus contorta.
Pinus densiflora.
Pinus excelsa.
Pinus montana Mughus.
Pinus strobus.
Pinus strobus densa.
Pinus sylvestris.
Pinus Thunbergi.
Taxus baccata aurea.
Taxus Canadensis.
Taxus cuspidata.
Thuya occidentalis.
Thuya occidentalis alba Victoria.
Thuya occidentalis aurea.
Thuya occidentalis Douglas' Golden.
Thuya occidentalis globosa.
Thuya occidentalis Hoveyi.
Thuya occidentalis Little Gem.
Thuya occidentalis Meehani
Thuya occidentalis pyramidalis.
Thuya occidentalis spiralis
Thuya occidentalis Tom Thumb.
Thuya orientalis aurea pyramidalis compacta.
Tsuga (Abies) Canadensis.
Tsuga (Abies) Canadensis Sargentii pendula.

Robinia hispida and *Pseudacacia* (Rose Acacia and Yellow Locust) are frequently terribly ravaged by borers. But this fact should not deter anyone from planting them moderately, as they are both very desirable. The latter is a mere shrub, the hairy stems and bunches of pea-shaped flowers rendering unusually attractive.

Rosa Carolina, *R. cinnamomea* and *lucida* are all specimens of "wild rose," as these large, single-flowered flowers are popularly termed.

Rosa microphylla has dark, shining green, spiney leaves, which are alone pretty.

Rosa multiflora Japonica should be distinguished from the *multiflora* used as stock on which to bud hybrid roses. This is of the Polyantha type, bearing small white flowers in bunches in great profusion.

Salix alba Britzensis and var. *vitellina* are particularly valuable for their colored bark in winter. In their way they are just as effective as the white birches in summer.

Salix pentandra has large, shining green leaves, even finer than the laurel, the resemblance to which gives it the common name of Laurel-leaved Willow. It can be grown with low branches, in bush form, and is particularly desirable for planting along the sea-coast.

Spiræa sorbifolia has curiously divided foliage, which does not in the slightest degree resemble the ordinary species. *Lindleyana* is much like it. One of the earliest plants to leaf out in spring.

The little round leaves of the *Symphoricarpos vulgaris* and its dark red berries in winter, make it valuable for massing in the foreground of shrubberies.

Tilia platyphyllos, the Broad-leaved European Linden, is a tree deserving greater popularity. It is of stronger growth than *T. Europæa*, but more compact than the American. It makes a handsome specimen tree.

The black fruit of *Viburnum prunifolium* is very ornamental, and the whole character of the tree or large bush—it can hardly be termed a tree—is very desirable.

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The Stone Pine, *Pinus cembra*, grows erect like a Deciduous Cypress.

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FEEDING ROOTS OF TREES.—Referring to F. K. Steele's article on "Feeding Roots of Trees," my observation led me to think that the greatest object of the trees in sending their roots to extraordinary depths was to obtain water. The mass of roots found at the bottom of quite deep wells, and the fact that trees send their roots into wells and dry up those that had never before failed to furnish water throughout the dryest seasons, and the great depths to which roots extend in dry ground, seem to confirm this idea. So far as my observations extend, trees send their roots to much greater depths in dry ground than in moist lands. I think trees and all other land plants are, generally speaking, "cannibals;" that is, the best fertilizer for any plant is the earth or humus which that plant produces by its decay. The most thrifty bushes, the most vigorous and productive uncultivated raspberries, the finest and most productive apple tree (said to have produced one hundred bushels in a year), and the largest elm I ever knew of its age, all grew where much wood had decayed. Sugar maples set, by me, on very dry, poor land, grew finely when fed by old, well-rotted saw-dust, and rapidly outgrew those nearby not

the Rockies, which is as hardy as the Platte Cedar. Outside of this, if you wish, you can put a row of *Picea pungens*, or Blue Spruce, which is the most beautiful tree on earth. One hundred dollars will make a fine evergreen barn, which will be of great use as well as an ornament."

SOME TREES AND SHRUBS OF EXTREME HARDINESS.—(Continued from March issue.)

Robinia hispida.
Robinia Pseudacacia.
Robinia viscosa.
Rosa Carolina.
Rosa cinnamomea.
Rosa lucida.
Rosa microphylla.
Rosa multiflora Japonica.
Rosa rubiginosa major.
Rosa rugosa.
Rosa rugosa alba.
Rosa rugosa flore plena.
Rosa spinosissima picta.
Rubus odoratus.
Salix alba Britzensis.
Salix alba vitellina.
Salix Babylonica.
Salix lucida.
Salix pentandra.
Salix purpurea.
Salix viminalis.
Sophora platycarpa.
Spiræa arguta.
Spiræa sorbifolia.
Spiræa Thunbergi.
Spiræa tomentosa.
Spiræa Van Houttei.
Symphoricarpos orbiculatus (vulgaris).
Syringa Amurensis.
Syringa Chinensis.
Syringa Emodi.
Syringa Japonica.
Syringa Josikæa.
Syringa oblata.
Syringa Persica.
Syringa villosa.
Syringa vulgaris.
Syringa vulgaris alba.
Syringa vulgaris alba grandiflora.
Syringa vulgaris Charles X.
Syringa vulgaris Ludwig Spath.
Syringa vulgaris Marie Legraye.
Tilia Americana.
Tilia argentea novæ.
Tilia dasystyla.
Tilia platyphyllos.
Ulmus Americana.
Ulmus campestris.
Vaccinium corymbosum.
Viburnum dentatum.
Viburnum Opulus.
Viburnum Opulus nanum.
Viburnum prunifolium.
Viburnum Sieboldi. [folia.
Vitis (Ampelopsis) quinque-
Yucca filamentosa.

Abies (Picea) balsamea.
Abies (Picea) concolor.
Abies (Picea) concolor violacea.
Abies (Picea) nobilis.
Abies (Picea) nobilis glauca.
Abies (Picea) Nordmanniana
Abies (Picea) pectinata.
Cupressus Nootkatensis.
Gingko biloba (Salisburia adiantifolia).
Juniperus Chinensis.
Juniperus communis.
Juniperus Sabina.
Juniperus Virginiana.
Juniperus Virginiana glauca
Larix Europæa.
Picea (Abies) alba.
Picea (Abies) Engelmanni.
Picea (Abies) excelsa.
Picea (Abies) excelsa inverta
Picea (Abies) excelsa pyramidalis.
Picea (Abies) nigra Doumetti
Picea (Abies) orientalis.
Picea (Abies) polita.
Picea (Abies) pungens.
Pinus cembra.
Pinus contorta.
Pinus densiflora.
Pinus excelsa.
Pinus montana Mughus.
Pinus strobus.
Pinus strobus densa.
Pinus sylvestris.
Pinus Thunbergi.
Taxus baccata aurea.
Taxus Canadensis.
Taxus cuspidata.
Thuya occidentalis.
Thuya occidentalis alba Victoria.
Thuya occidentalis aurea.
Thuya occidentalis Douglas' Golden.
Thuya occidentalis globosa.
Thuya occidentalis Hoveyi.
Thuya occidentalis Little Gem.
Thuya occidentalis Meehani
Thuya occidentalis pyramidalis.
Thuya occidentalis spiralis
Thuya occidentalis Tom Thumb.
Thuya orientalis aurea pyramidalis compacta.
Tsuga (Abies) Canadensis.
Tsuga (Abies) Canadensis Sargentii pendula.

Robinia hispida and *Pseudacacia* (Rose Acacia and Yellow Locust) are frequently terribly ravaged by borers. But this fact should not deter anyone from planting them moderately, as they are both very desirable. The latter is a mere shrub, the hairy stems and bunches of pea-shaped flowers rendering unusually attractive.

Rosa Carolina, *R. cinnamomea* and *lucida* are all specimens of "wild rose," as these large, single-flowered flowers are popularly termed.

Rosa microphylla has dark, shining green, spiney leaves, which are alone pretty.

Rosa multiflora Japonica should be distinguished from the *multiflora* used as stock on which to bud hybrid roses. This is of the Polyantha type, bearing small white flowers in bunches in great profusion.

Salix alba Britzensis and var. *vitellina* are particularly valuable for their colored bark in winter. In their way they are just as effective as the white birches in summer.

Salix pentandra has large, shining green leaves, even finer than the laurel, the resemblance to which gives it the common name of Laurel-leaved Willow. It can be grown with low branches, in bush form, and is particularly desirable for planting along the sea-coast.

Spiræa sorbifolia has curiously divided foliage, which does not in the slightest degree resemble the ordinary species. *Lindleyana* is much like it. One of the earliest plants to leaf out in spring.

The little round leaves of the *Symphoricarpos vulgaris* and its dark red berries in winter, make it valuable for massing in the foreground of shrubberies.

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JAMAICA SORREL.—The plant known among us as Jamaica Sorrel, or simply the "jelly plant," is a *Hibiscus*. The *Hibiscus* is a genus of the Mallow tribe, *Malvaceæ*, which contains a thousand species (grouped into forty or more genera), several of them highly esteemed in medicine, their uniform character being to abound in mucilage, and to be totally destitute of unwholesome qualities. The wood is light and of little value, though the light, straight stems of some of the kinds are used for rocket-sticks. Some sorts afford food, as the Okra and the Ramturai of India; others furnish valuable fibre, of which "Cotton is King;" while in various other species the coarser fibre of the bark is used for making cordage; and that of *Hibiscus arboreum* of the West Indies for whip-lashes.

Many of the genera are splendidly or curiously beautiful, as the Hollyhock in all its varieties; the Abutilon, Indian Mallow or Fairy Bell; the *Achania Malvaviscus*, common in our gardens, almost everblooming, with scarlet, unopening flowers; and most showy and most various, the *Hibiscus*. Of this genus, our native sorts are as fine as the foreign ones, and as variously colored, being purple, carmine, rose-colored, or a delicate yellow, all having a large spot of deep, rich color at the base of the corolla. Of the garden varieties, that one with the large, single, soft rose-colored flowers was, I think, the first exotic species introduced (except the old-fashioned Rose of Sharon, *H. Syriacus*) which, coming from China, was called *Rosa sinensis*, which name is now extended to all its hybrids, with an added epithet to denote the variety.

There is a beautiful and interesting species, Mexican, I believe, that was formerly to be seen in every door-yard on the country roads about us [in Florida], and there is still here and there a bush that has escaped the freezes. The blossom is large and very double; when first it opens, it is pure white; gradually it takes on a faint flush of rose that slowly deepens and suffuses the whole flower. The next day the rosy hue has deepened to crimson, and after some hours it "withers in its pride," but cannot be said to fade. This is *Hibiscus mutabilis*, commonly called, from the shape and color of its leaves, the Cotton Rose.

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INTENTIONAL SECOND EXPOSURE

Nevertheless, the results as related are gratifying to some extent to those who have not had the greater privilege, and some good has been done. The writer is inspired with some such feelings, for it may indeed be felt a privilege to have seen through the Phipps' Conservatories, at Pittsburg, Pa. Fortunately, here is a permanent institution, under good management, and free to all who can journey to Pittsburg, or who are already there, and the pleasure is divisible into numerous portions.

It is no easy matter to do sufficient credit to the subject from such a cursory examination of the conservatories as the writer's limited time made necessary, for the huge collection of plants of every description affords opportunity for endless enjoyment and study. Then, too, Superintendent Falconer is always studying how he can create more interesting arrangements of the plants and flowers, and introduce new and rare plants. The buildings and many of the plants were the gift of Mr. Phipps, one of Pittsburg's philanthropic residents, who wanted the masses should have and recognize the pleasure and beauty and healthy instruction to be found among plants,—and Mr. Falconer's efforts are always pointing towards this end. There is always some particular display to interest even the ones generally ignorant of plant individuals, and almost any one of the displays is perhaps larger than any other of the same plants before the public in any city. Twenty-seven thousand visitors have been counted in one day—Easter Sunday—and probably forty to fifty thousand during a week, about Easter or chrysanthemum time.

In their respective seasons may be seen great shows of cinerarias, hydrangeas, roses, chrysanthemums, interspersed with other flowers of all kinds appropriate to the arrangements. Perhaps no one is so particular as Mr. Falconer that the groupings and everything connected therewith shall be perfectly natural, and as harmonious as can be; and no one could be more successful in their efforts. Many of the effects produced would do credit to Dame Nature herself, such, for instance, as the rockwork over which hangs a mammoth specimen of the Sword Fern, from beneath whose fronds issues a beautiful stream of water, which falls naturally and gracefully over the rocks. The surroundings are in perfect keeping, decked with ferns and other moisture-loving plants, making the whole a charming scene indeed. At the foot of this cascade, and receiving a continual wetting, was a plant that occasioned considerable surprise in that it was capable of standing so much water—*Aspidistra lurida*, a small plant with broad, evergreen leaves, which stands considerable neglect as a house or decorative plant. Another specimen of the above-mentioned fern is also brought to use with great effect, in the formation of a picture which must ever be in the memory of the writer; it is arranged to overhang a window between one of the office-rooms and the main conservatory, through which, from the room side, may be seen the palms and general tropical plants. A marble figure is arranged before the window, just setting off the whole scene in a most picturesque and artistic manner.

One is impressed, on entering the conservatories, with the perfect order and cleanliness of everything. The pots are clean; the growth of the plants healthy; the arrangement orderly, yet perfectly natural. Every plant is a specimen,—and they number many, many thousands. Nothing is overgrown, though growth with such favorable surroundings is almost rampant. Huge palms have made marvelously rapid growth, one (*Cocos plumosus*) reaching the top of the largest house, fifty-one feet in height,—and this (after allowing for its original height of fourteen feet), in the space of seven years. Many of the plants, like the *Ficus*, which are tempted to grow too rapidly to suit their quarters, are promptly rooted by the ærial-pot method, and beheaded.

The collection of economic plants is by no means the least interesting. Superintendent Falconer personally visited Jamaica and other tropical countries in search of these plants, and succeeded in gathering a notable collection, among which may be mentioned the following: Para rubber, sugar, tea, chocolate, cocoa shrub, mango, bread-fruit, guava, loquat, croton oil, kola-nut, vanilla, ebony, teak, ginger, arrow-root, lignum-vitæ, sycamore of Scripture, mahogany, cinnamon, camphor, New Zealand flax, sisal hemp, manilla hemp, olive, Peruvian bark, Carob tree, tamarind, allspice, cloves, tropical almond. The following were in fruit: Pine-apple, banana, orange, coffee, tree-tomato and fig. They are all carefully labelled, and most frequently have a card attached noting their product. These are all

especially valuable as object lessons for the public school children, who visit the conservatories very frequently.

There is a beautiful specimen of the Travellers' Tree, *Ravenala Madagascariensis*, possibly twenty feet in height, and spreading out in its customary fan-shape form almost the same distance. Its popular name comes from the receptacles formed by the leaves which catch and hold water, and alleviate the thirst of many a weary traveller. Another curious tree, a palm, is one of the *Calamus* species, or Rattan Palm, which was briefly mentioned in the MONTHLY recently. It is of running habit, having long rope-like stems, which are quite useful in tying and cane-work. These willowy stems are supported in their upward growth by means of long runners covered with hooked thorns, which fasten themselves to whatever they touch. The *Nepenthes*, a genus of Pitcher-plant, is grown as Nature finds it—in a running form. Grown in baskets, as customary, larger "pitchers" are formed, but the running habit is not permitted. A specimen plant, with a very striking flower, is *Pitcairnia coralina*. It had several pendulous spikes of brilliant scarlet flowers. Several cocoanut seeds, which are "sown" with the husks on, were seen sprouting thriftily, the shoots issuing right from the sides of the thick husks.

Neither space nor memory will admit of a deserving, lengthier article relating to these conservatories. The writer rather hopes that the readers of the MONTHLY,—many of them, at least,—may have the opportunity of visiting them in person.

SYSTEMATICAL CLEANLINESS ABOUT THE GREENHOUSE AND GARDEN.—"Some men can do twice as much on an acre as another. It is order, system and cleanliness that enables him to do it. 'Dirt is matter out of place.' That is a true definition. I once found fault with a man, who was then a partner, that his rubbish pile contained everything from decent potting soil to broken glass, hoop iron and empty beer bottles. He rather peevishly replied that he had no time to spare and was glad to get rid of the stuff out of the greenhouses. That 'time' excuse is the worst of all, and the man who lets his wagon stand out in the sun till the hubs are cracked, has always the most time to spin a yarn, or see how much old Bill Jones' cows bring at auction. If my friend had had a pile for stuff that was purely rubbish, and another for old soil and plants and vegetable matter that would come useful some day, it would have been much time saved in the end, and some money."

The foregoing extract from "Scott's Florists' Manual" is a strong piece of advice which every one might heed to advantage. The waste of time and material about many places—commercial, public and private—is appalling.

NEW OR RARE PLANTS.

NEW PLANTS.—The introducer of new plants is frequently lost sight of in their general dissemination, and much deserving credit goes astray. The following have been brought to public attention by Mr. Harlan P. Kelsey, Kawana, N. C., many of them having proved of exceedingly great value to cultivation:

Tsuga Caroliniana (Carolina Hemlock), *Azalea Vaseyi*, *Vaccinium hirsutum* (Hairy Huckleberry), *Prunus Alleghenensis*, *Vaccinium erythrocarpon*, *Gaylussacia ursina* (Buckberry), *Diervilla sessilifolia* (Yellow Mountain Honeysuckle), *Robinia hispida rosea*, *Leiophyllum buxifolium* var. *prostratum* (American Mountain Heath), *Rhododendron punctatum* var. *album*, *Lilium Grayi*, *Shortia galacifolia*, *Polygonum cilinode* (Buckwheat Vine), *Trillium stylosum*, *Krigia Dandelion* var. *montana* (Mountain Dandelion), *Aconitum reclinatum*, *Liatris spicata* var. *montana*, *Carex Fraseri*, *Houstonia purpurea* var. *tenuifolia*, *Viola pedata alba*, and the delicate little mountain *Saxifraga leucanthemifolia*, and others more largely of economic interest; while he has distributed many others which were formerly but rarely seen in cultivation.

SHRUBS HARDY IN MINNESOTA.—The following are recorded as thoroughly hardy in Minnesota: *Syringa Japonica*, *Lonicera Morrowii*, *Lonicera Standishii*, *Cratægus glandulosa*, *C. pinnatifida*, *C. microcarpa* and *Ribes triste*.

A DWARF LARGE-FLOWERED DOGWOOD.—It is reputably reported that a dwarf form of *Cornus florida* has been secured and will be grown extensively for the market.

THE HARDY FLOWER GARDEN.

DORONICUM PLANTAGINEUM EXCELSUM.—The two illustrations accompanying this well illustrate the beauty of *Doronicum plantagineum*

DORONICUM PLANTAGINEUM EXCELSUM.
(GREATLY REDUCED.)

excelsum, although so greatly reduced in size. The very large yellow flowers, produced at first on short stems, in early spring, the stems elongating and new flowers appearing from time to time, are novel and very attractive. There are several other species, prominent among which is *Doronicum Clusii*. The latter is a trifle earlier to bloom, but more slender and with a smaller flower; it is generally inferior to *excelsum*. "Harper Crewe" is a synonym of *excelsum*. A shady situation—not too dense—suits it as well, or even better, than full sunlight.

BLOOD-ROOT IN CULTIVATION.—While heartily in sympathy with the movement for cultivating wild flowers so far as possible without exterminating them from their native haunts, I think that no single one of them will be found, all things considered, finer than the blood-root. It appears almost with the crocus; the flowers are handsome; it increases rapidly in ordinary garden soil; and the entire plant is so curious as to render it a constant source of enjoyment. The buds form in autumn, and I doubt not that it could be as easily forced in a cool room as a hyacinth; though I have never seen the experiment tried.

BESSIE L. PUTNAM.

RUDBECKIA "AUTUMN GLORY" AND "GOLDEN GLOW."—A belated letter from Mr. W. C. Egan, Highland Park, Ills., comments on the article "Rudbeckia Golden Glow" in the October issue, which contained an extract from the London *Journal of Horticulture*, inferring that "Golden Glow" was the same as "Autumn Glory," which had been known in England for years. The writer in the journal stated he thought he had seen it quoted in Barrs' catalogue as "Golden Glow." Mr. Egan sends a flower of "Autumn Glory" from a plant sent him under that name, and the difference between the two is quite evident. The latter has a long cone or disk, while the disk of the other is rounded and comparatively flat. It is just as Mr. Egan says, "A plant that would increase with such rapidity, and is so attractive in its parts, if known in England twenty years ago, would have been known here long before this." That the previous

FLOWER OF DORONICUM.
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correspondent was undoubtedly misled, is also proven by Barrs' catalogue referred to, in which both varieties are quoted and described.

STANDARD CRIMSON RAMBLER.—In the March issue mention was made of the effectiveness of the Crimson Rambler Rose trained to a single stem and allowed to make a head.

With this is an illustration fully bearing up the statement. The form will be seen to resemble the Kilmarnock Willow, but much less formal and with the charming addition of brilliant flowers.

FRUITS AND VEGETABLES.

BEAUTY IN COMMON THINGS.—We find it very pleasant, every year, to grow something new in vine or plant. Last year we grew peanuts, and were very successful growing the Spanish variety. They were a curiosity to our friends. The plants are very beautiful with their clover-like foliage.

We also sowed what we called "Italian peas," given us by an Italian friend, much used by the Italians in this country, importing from Italy what they do not grow in their own small gardens. The plants form a beautiful border, growing in a dwarf, bushy manner. We did not care for them green, but they are nice dried, used in soup.

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For four years we have grown the Husk Strawberry, which makes such delicious preserves and jam. For two years past we have found ready market for all our surplus.

An English lady, visiting us last season, expressed surprise that we only grew the Scarlet-runner for beauty of vine and flower. She said that in England they were considered the very best green bean as well as shelled. Also advised us to try the hips of our native thorn in making marmalade, which we did. Members of the family, who had visited England, said it was very much the same as the marmalade furnished them at breakfast while in London. We think, perhaps, it were better to use the English Hawthorn, which we will try the coming season.

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LABOR-SAVING WHEEL-HOES.—"Among the principal labor-saving tools in the hands of the market gardener must be considered Wheel-hoes. Nay, we may insist that it leads all others, for they are really indispensable, and

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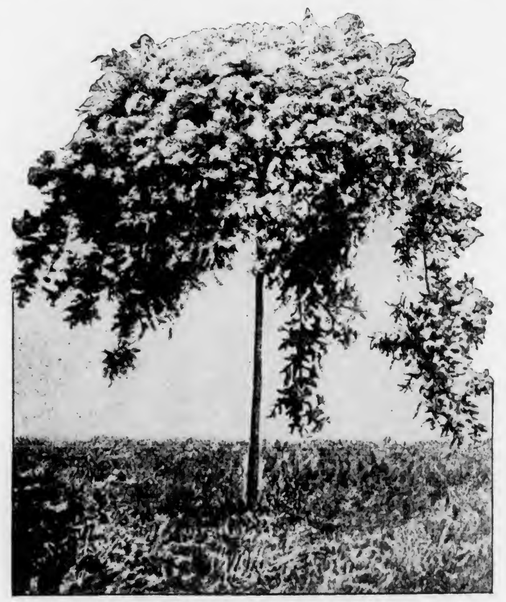

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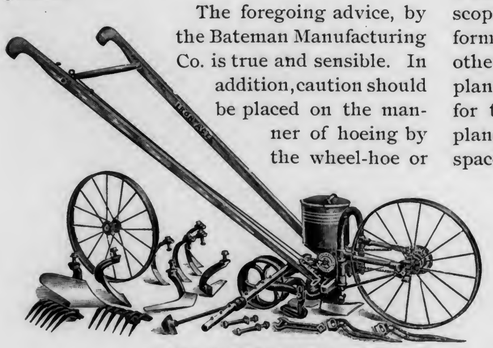
INTENTIONAL SECOND EXPOSURE

without their aid it would be an almost impossible task to keep the market supplied with such immense quantities of row-grown vegetables. They have done away with the back-breaking and time-killing methods of the olden time, one man performing in a more thorough manner, and with greater ease to himself, the labor of several men. As with all other improved methods of labor, it requires a little practice to enable one to realize the best results with a wheel-hoe. A novice will usually push steadily ahead; not so—give the tool a *thrust* ahead, watching the wheel rather than the hoe, and taking a step at each thrust; this brings a result which the term wheel-*hoe* implies; an ordinary hand-hoe would accomplish little if simply dragged through the ground."



HAND GARDEN PLOW.

The foregoing advice, by the Bateman Manufacturing Co. is true and sensible. In addition, caution should be placed on the manner of hoeing by the wheel-hoe or ordinary method,—the surface must not be scraped, simply cutting off the tops of weeds, and leaving a hard surface through which rain and air will not readily pass; but should be stirred—not too deeply in the case of surface-rooting vegetables.

Wheel-hoes are constantly being improved to make them useful in other ways. The above-mentioned company make an implement which sows in hills and drills, hoes, rakes, cultivates, levels, plows (not deeply), furrows, hills, and covers—all by a machine worked by hand. One of these useful articles, combining many garden tools, is here illustrated by courtesy of the Bateman Co.

THE MOST PRODUCTIVE VEGETABLES.—As to what garden vegetable produced the largest bulk of food on an expenditure of the least cash and labor, we believe that on a given area of land the Swiss Chard will give the largest proportion of edible matter. This is a variety of beet, the very thick leaves of which are eaten, every plant of which can be relied upon to give a sufficient number of thick, succulent and very palatable stalks to make a dish in itself. Cabbage and cauliflower produce to each plant sufficient for a dish for the table, but they take much longer to develop than chard, and all plants will not invariably produce a head. Egg-plant will, when in good bearing condition, produce three or four fruits full enough for a meal from each plant. Tomatoes will produce to the plant enough for several meals. Watermelons give from each plant sufficient for three or four meals. Cantaloupes a less quantity, but these occupy a very large scope of ground as compared with the bushy formed plants above mentioned. Of all the other esculent vegetables it requires many plants to afford bulk enough to make a dish for the table, and with the multiplication of plants there is a corresponding increase in space occupied and cost of labor.

—*Landreth's Seed Catalogue.*

PYRUS BACCATA FOR APPLE STOCK.—The winter of 1898–99 was a disastrous one in many sections of the United States, where a great many fruit trees were destroyed. The apple, among others, suffered very much, killing roots and all. It has led to an effort to secure more hardy stocks, and *Pyrus baccata* is possibly more in favor than anything else at the present time. This apple produces, when not grafted, numerous clusters of small fruit about the size of some of our larger native cherries, and is fairly good for culinary purposes. Seedlings of the Transcendent Crab have also been tried with good results thus far. Mr. E. H. S. Dartt, of Owatonna, Minn., places little faith in any of these so-called hardy roots, and claims that all were killed alike in his vicinity. Of course, this does not demonstrate that one will not at least prove less liable to being killed and experiments along the line mentioned are worth the effort. Where the snow-fall was heavy, and remained on the ground during the coldest weather, the roots were preserved. By this is shown that some temporary cover, acting as a mulch over winter, would help them.

BIOGRAPHY AND LITERATURE.

PARENTAL CARE.

The scented birk and hawthorn white
Across the pool their arms unite,
Alike to screen the birdie's nest.—BURNS.

VALUABLE HORTICULTURAL REFERENCE BOOKS.—At a large meeting of horticulturists in western Pennsylvania, recently, it was asked what was the best book on horticulture that would catalogue most of the trees, shrubs, etc., in general cultivation in this country, and describe them faithfully—a work that could be kept continually and conveniently at hand. The answer promptly made was "Some of the leading nurserymen's catalogues," and that of Thomas Meehan & Sons was particularly mentioned. Few persons realize the labor and expense put on catalogues of this kind in the effort made to compile careful descriptions, and make them generally valuable to those requiring help in that direction. Just before the conductors is the new catalogue of Ellwanger & Barry, Rochester, New York, which is the result of several years' preparation. That it is a credit to the firm is saying but little. It deserves a position in the library.

CATALOGUE ACCURACY.—It is decidedly encouraging when catalogue compilers show an earnest effort to be accurate in the names of plants, orthography and descriptions. To intended purchasers, such catalogues are assurances of good faith, and an inestimable help in careful selection. The catalogue of F. H. Horsford, Charlotte, Vermont, is a good example of what can be done in this direction. *Index Kewensis* is the authority first recognized, and is undoubtedly the best except in one point, *i. e*:—Stable varieties are not recognized, but referred without explanation to the species from which it originated. Thus the well-known *Berberis Thunbergi* is written as synonymous with *vulgaris;* while their points of difference are very marked. By this it will be seen how even a good authority may not always suit existing conditions. In the particular catalogue above mentioned, there are several examples where it would seem less desirable to follow the *Index* and yield to the names which almost everybody knows. It would avoid confusion, and that is what catalogues are for. To be sure, the old names are given also, but that plan cannot always be adhered to. The more particular adoptions likely to confuse are *Anemone Hepatica* instead of *Hepatica triloba; Cypripedium humile* (*acaule*); *Rosa Luciæ* (*Wichuraiana*); *Vitis* (*Ampelopsis*) *Diervilla* (*Weigela*); *Pinus Laricio* (*Austriaca*); *Symphoricarpos orbiculatus* (*vulgaris*). Broadly speaking, no one knows these names, and but few ever will; the others are almost everyday names, and will never be totally supplanted. These are the most serious changes, and not very weighty, perhaps; and the catalogue, as said before, is an advancement on which Mr. Horsford may be congratulated.

THE SUN-FLOWER DOES NOT TURN WITH THE SUN.—Popular errors are difficult to eradicate.

After carefully reading Professor Meehan's interesting "Contributions to the Life-History of Plants," No. 13, in the Proceedings of the Academy of Natural Sciences of Philadelphia, 1899, I called the attention of a friend to "The Movement of Plants," who, after reading the article remarked: "Last summer, in Michigan, I had seven kinds of sun-flowers in my garden, and I observed them turning to or from the sun very much as that article describes; and the author's conclusions, 'It may be assumed that we have to look to various phases of life-energy in the plants themselves for the final explanation,' seem very just." Many, from childhood, have been familiar with the *Helianthus*, and took it for granted that the flower follows the sun—hence its name. Original investigation is persistently made by few, comparatively, and many remain long unconvinced of the most common-sense things. Original investigation was long a dangerous

thing—witness Galileo, Harvey, etc. And even so late as the time of Dr. Livingstone, he said that he came near being deprived of his diploma because he made an original remark.

That the public need line upon line before they can give up a false theory and adopt a true one, is vastly in evidence from the fact, that such a common-sense and natural solution of the "Eccentricity of the annual wood circles," mostly a lack of nutrition being the obvious cause. The whole article should be read, as it is too important to be condensed.

San Diego, Cal. MRS. E. O. ORCUTT.

ORIGIN OF THE JAPANESE CEDARS.—The Japanese Cedar, *Cryptomeria Japonica*, so common in Japanese gardens, has never been found in a wild state. As in the case of so many of our garden evergreens brought from Japan under botanical names, it is suspected of being a form of something else. There is a striking resemblance between the seeds and those of our mammoth *Sequoia*.

CYCLOPÆDIA OF AMERICAN HORTICULTURE.—This great work, by Prof. L. H. Bailey, which is to be finished in four volumes, is advancing rapidly. It is announced that the first volume is now ready for subscribers.

MISSOURI BOTANIC GARDEN.—The 11th annual report of the Missouri Botanic Garden has made its appearance. Papers illustrative of diseases in the wood of *Libocedrus* and *Taxodium* will be of special interest to those interested in forestry, and the working botanist will welcome a paper on a section of the genus *Euphorbia*. Both are copiously and beautifully illustrated.

HOME AND SCHOOL GROUNDS.—Mr. Warren H. Manning, of Boston, has published a booklet of eighteen pages describing and illustrating the surveying and arranging of home and school grounds.

GENERAL NOTES.

A NEW HORTICULTURAL SCHOOL BUILDING.—Minnesota now boasts one of the most complete horticultural buildings connected with a school or college in the United States. It was completed and occupied January 1st, 1900, and is connected with the Minnesota School of Agriculture and Experiment Station, St. Anthony Park. The building and equipment cost $67,000.00, and consists of a main building, and annex for a greenhouse, laboratory, machine shed, about 4,000 feet of glass, and a good nursery cellar. A large number of students can now be accommodated. This term the classes in horticulture number 178. A very important feature of the school work consists of practice by the students of seed-sowing, transplanting, the growing of plants by cuttings and grafting, the packing of nursery stock, pollination, testing of seeds, the making of Bordeaux Mixture and grafting wax, and similar horticultural operations.

TREE-PLANTING ALONG CITY STREETS.—A law recently passed in Minnesota, authorizes park boards in cities to plant trees when petitioned by property owners concerned, and to assess the cost, not exceeding twelve and a half cents a front foot, on the property improved, and this to include the expense of maintaining the trees for three years and replacing any that may die. The system has been tested in Minneapolis for fifteen years, and 15,000 vigorous, well-protected trees along the streets prove its success. The outlay has been remarkably small.

—*The American Church and S. S. Mag.*

RAPID ADVANCE IN PARK PLANTING.—It is said that during the fall last past, more than 205,000 young trees and shrubs have been planted in the parks and boulevards of the South Side, Chicago, Ills. In Jackson Park, the site of the World's Fair, the work of reconstruction covers some sixteen acres.

FLY TRAPS.—To catch flies, Prof. Parrot, of the Kansas State Agricultural College. employs water-tight tin troughs, holding a thick layer of molasses at the bottom, or in which kerosene emulsion or some fly-powder, or similar material is placed. Flies fall or wander in when these traps are placed at the bottom of window panes. They must be constructed to fit the frames. Those he employs are 21 inches long, three-quarters of an inch wide, and three-quarters of an inch deep.

POLYPTERIS HOOKERIANA.

POLYPTERIS HOOKERIANA.

HOOKER'S MANY-FEATHER.

NATURAL ORDER, COMPOSITÆ.

POLYPTERIS HOOKERIANA, Gray.—Stouter than *P. Texana;* one to four feet high, above glandular-pubescent and somewhat viscid; leaves from narrowly to broadly lanceolate, mostly three-nerved below; involucre many-flowered, broad, half an inch or more high, of twelve to sixteen lanceolate bracts in two series, the outer looser and often wholly herbaceous, the inner with purplish tips; ray flowers eight to ten, the deeply three cleft rose-red rays half an inch long, but sometimes reduced or abortive; pappus in the ray a crown of six to eight short and obtuse, rather rigid spatulate paleæ; in the disk of narrowly-lanceolate, thin paleæ, traversed by an excurrent costa, attenuate at apex into a slender point or short curve, nearly of the length of the akene. Gray's *Synoptical Flora of North America.*

The specimens from which the drawing is made were obtained from seed sent by a correspondent from Fort Worth, Texas, without further indications of the locality than that it grew in the upper regions of the Red River. Dr. Gray, however, notes that its home is on the dry plains of Nebraska and Texas. In several excursions in that region by the author, it was not met with; but, judging from the specimen from which the branch was taken, it must prove an interesting element in the wild-flower scenery of the dry plains of those regions, for doubtless it is more or less abundant in the localities in which it has made for itself a home. That it is an imigrant from more southern latitudes originally, is more than likely from the fact the some half-dozen species of which the genus consists are rather common in Mexico; while this species has no relative near it, though two are found in southern California. The first one of the genus was raised by the celebrated Cavanilles, at the Botanic Garden at Madrid, from seed received from New Spain, in Mexico. He could not distinguish it from an *Ageratum*, and named it *Ageratum lineare*. Later, in 1806, another Spanish botanist, Mariano Lagasca, saw good reasons for dividing it from *Ageratum*, and erected the new genus *Palafoxia* for it. Dr. Gray says the name is derived from José Palafox, the noted Spanish general. The author has not at command the work of Lagasca in which the plant was described, and which possibly conveys the suggestion as to the person the name was to honor; but General Palafox was not a noted general at that time, but a youthful hanger-on at court, being born in 1780, and apparently with nothing to warrant special botanical honors. He had bravery, and led his townsmen in the celebrated seige of Saragossa, in 1808. His honors as Duke of Saragossa, did not reach him till 1836. The original, *Palafoxia linearis*, still continues as *Lagasca* arranged it.

But others, since found and classed with *Palafoxia* in the first instance, have since been separated, and the genus *Polypteris* founded for them by Nuttall, chiefly on account of the peculiar and pretty crown formed by the pappus, as seen in fig. 5,—*Polypteris* being from the Greek, signifying many wings or feathers. No common name has been given to it. Many-feather is here simply suggested for popular approval. Hooker's name is associated with it by Dr. Gray, evidently through Hooker having figured it in the Botanical magazine as *Palafoxia Texana*, already so named by DeCandolle, from which, however, it was shown by Dr. Gray to be different.

The plant has no popular history. It is a pretty wild flower, adorning the dry and barren plains for ages unseen by eyes that could appreciate its beauty, and only in recent years finding its way into gardens where its beauty has made it welcome.

The plant, however, furnishes so many popular lessons, that a more than usual number of dissections have been figured on the plate. The numerously-divided crown to the apex of the akene or seed, fig. 5, has already been adverted to, and is very beautiful when examined with a pocket lens. It was this which led Nuttall, in his "Genera of North American Plants," issued in 1818, to establish the genus,—*Polyp-*

COLOR PLATE

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COLOR PLATE
INTENTIONAL SECOND EXPOSURE

teris integrifolia being the species described. This was from a specimen collected in Georgia, by Dr. Baldwin, on the banks of the River Altamaha, and this is the most northern range yet found for it. It extends to Florida, usually found in dry sandy places. One of the florets of the disk is displayed in fig. 4. In this stage the feathery pappus is erect. It does not spread till the akene is maturing. The remarkably slender tube projects beyond the pappus, and is terminated by a small, campanulate limb. This flower is taken at an early stage. When further advanced, the crown of anthers is carried up beyond the limb, by the pressure of the expanding lobes of the pistil. After the pollen has been exposed by the rupture of the anther cells, the cloven pistil wipes out most of the pollen, and proceeds still further. Freed from the growing force of the style, the empty anther cases fall back within the limb. In the figs. 8. 8, of the perfect head of flowers we may see the dark column of anthers being lifted by the style. In fig. 9, we see the divided stigmas alone with their supporting style, the column of stamens having become free, and retired back within the corolla. This behavior is especially instructive to those who take an interest in observing how flowers are fertilized. The slender tube is very unfavorable to the labor of an insect in collecting sweets from its base,—while the dense mass of anthers, against the throat of the corolla, renders such an effort on the part of a honey-gathering insect still more difficult. The flowers are visited freely by bees for the sake of the pollen,—and this seems to be all the sacrifice the plant is able to offer for the good of the outside world. It receives no benefit from the visits of insects, assuming that cross-fertilization may be of some service,—as, from the process already described, it is strictly self-pollinating.

The ray-floret, fig. 3, now commands attention. It is the same long, tubular structure as in the other case ; but the upper portion has become enlarged, and instead of being five-lobed and bell-shaped, it has split on one side, and formed a somewhat hand-shaped, but only three-divided blade. The two laterals are larger, each evidently being two of the original five-parted corolla, united together. With this change from bell-shaped to strap-shaped, is another singular fact in the suppression of the anthers, the ray-floret having a pistil only. The feathery pappus has also been almost suppressed. It has been noted in flowers of this character, that when this suppression of stamens occurs in flowers, where the disk-flowers remain hermaphrodite, and where by chance the tubular disk-flowers should become strap-shaped, the pistillate character follows the strap-shaped form. It would be called a double flower by florists. The flowers in this double condition, would be all wholly pistillate. The double *Dahlia* is a well-known illustration of this fact. Just why the strap-shaped condition and pistillity should be co-related, remains yet a mystery which some happy biologist may in the future have the good fortune to explain.

In fig. 2, we have a longitudinal section of the involucre, or outside cup that encloses all flowers of the order of *Compositæ*. If the stem had elongated, and formed a branchlet instead of a flower, each of the twelve or sixteen bracts, of which this involucre or cup is formed, would have been a leaf scattered along the stem instead of being all transformed and presented in this arrested state.

The leaves furnish a point of interest in their strongly-three-nerved character. Nearly all the species have this so nerved in their lower leaves, but it is rare, even in the typical forms of our present one, to have the upper leaves so well characterized. It is a good lesson in variation for the student. Nature casts nothing in one uniform mould. Allowing that form results from internal energy operating from the earliest conception of the individual plant, and that the degree of energy must vary according to the power to assimilate nutrition, exact reproduction is impossible. And yet energy must expend itself ultimately. We learn from this that plants must vary in their own individual selves, as well as from each other,—but that there is a point in each individual case beyond which even variation cannot go. Evolution, as taught in modern schools, is probably sound doctrine. But it cannot be proved by individual variation, as it is so often attempted to be.

EXPLANATION OF THE PLATE.—1. Branch of a plant from Texas. 2. Longitudinal section of the involucral cup. 3. Ray-floret and akene. 4. Disk-floret, with akene and pappus. 5. Mature akene, with feathery pappus spreading. 6. Column of stamens elevated by the growing styles. 7. Stamens drawn back within the floret, and style and stigmas free.

WILD FLOWERS AND NATURE.

SPRING-TIME.

The merry May has pleasant hours
  And dreamily they glide,
As if they floated like the leaves
  Upon a silver tide.

The trees are full of crimson buds,
  And the woods are full of birds,
And the waters flow to music,
  Like a tune with pleasant words.

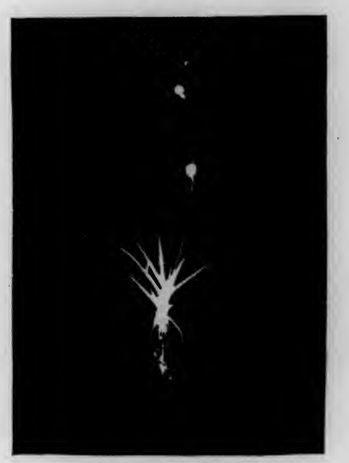
The verdure of the meadow-land
  Is creeping to the hills,
The sweet, blue-bosom'd violets
  Are blowing by the rills ;
The lilacs have a load of balm
  For every wind that stirs,
And the larch stands green and beautiful
  Amid the sombre firs.

—N. P. WILLIS.

SUBULARIA AQUATICA, L.—In the depths of the primæval forest, under the high mountains of the Franconia Notch, New Hampshire, lies a centre of exotic civilization, in the shape of the Profile House, whither every summer a mountain-loving detachment of the society of our great cities transfers its doings. The Profile House stands on a water shed. To the south of the big hotel lies Profile Lake under the great stone face, flowing southward at length to become the Merrimac. A short distance north of the hotel lies Echo Lake, which flows by Welch Brook and the Ammonusuc north and the west into the Connecticut.

These lakes, which though small in area, are found by actual measurement to be some hundreds of feet deep, were the Mecca of two pilgrimages of mine while among the White Mountains in the summer of 1897. I explored Echo Lake with special interest, it being one of Gray's cited localities for the awlwort. My first trip on September 1st, was hurried and only revealed some lily pods, and the gray globular heads of a pipewort rising above the water, though I did not fail to notice and wonder at numerous little tufts of short, sharp, green leaves growing out of the white sand about a foot beneath the water.

On my second visit on September 22nd, I was driving with some friends from Twin Mountain to the Profile, and asked their indulgence for a few moments that I might more thoroughly explore the margins of the lake ; and while they were listening to the famous echo for which the lake is named, I walked all about the margins catching sight of arbutus plants and mountain cranberry, and more pipewort and lily pods as I explored the water's edge.



SUBULARIA AQUATICA.

At last, just as I was about to give up the search, my eye caught sight of a thread-like stem rising from one of the numerous tufts of subulate root-leaves, bearing a sparse crop of small, green, globose capsules, all easily seen growing against the white sand about a foot beneath the surface of the brilliantly clear cold water. I bared my arm and dragged the plant from its foot-hold, bringing up with it a cluster of shining white, nerve-like roots, and packed it carefully away in a small tin box I had brought for the very purpose of its capture.

It struck me then as strange that a flower of such high class as a crucifier should bloom and fruit successfully entirely under water. (See illustration.) NEWLIN WILLIAMS.

THE AMERICAN PÆONIA, P. BROWNII.—The pæony is one of those old garden flowers that have become scattered and mixed, and improved upon innumerable times until very few persons know one true species from another. Much less is it known that there is an American species, though this is not altogether surprising in view of the difficulty accompanying any attempt at domesticating it. This plant, known as *Pæonia Brownii*, is to be found only along the Pacific Coast, and then very sparingly. In the description given in "Brewer and Watson's Geological Survey," it is said: "This plant endures a great range of station and climate, from wet to very dry soils and from the hot plains of Southern California to near the confines of perpetual snow on the mountains." It is, never-the-less, delicately constructed, and attains a growth of only about a foot in height. The flower is quite unlike those we are more familiar with, being about 2½ inches in diameter, the thick and leathery, dull, dark red petals barely equalling the green sepals in length. But it is attractive, and would please everyone fond of flowers for themselves and not so particularly for the show they make. The pæony is a member of the same family as the buttercup, and in this species one can see a closer resemblance in general appearance than with our garden kinds.

BIRD-LIFE.—A correspondent states that, for many years, in boxes for martens, there have been four pairs and no more than these eight birds come to the four boxes prepared for them. He asks if martens are famous for long life; or if a pair of young ones, or young brides and bridegrooms, take the places of the dead old ones?

HABENARIA AND OTHER WILD, NEW JERSEY FLOWERS.—A much finer *Habenaria* than the one figured in the MONTHLY for February, is found near Tenafly, New Jersey, the stems 18 to 20 inches, the heads broad, made so by the large petals and long fringe. The lip is fully two inches long with fringe half-inch long on each side. When living in Tenafly, I sent hundreds to New York. In the same locality is found *Cypripedium spectabile*, *Orchis spectabilis*, a large bed of *Kalmia glauca*, and some *K. angustifolia*, *Osmunda cinnamomea*, *O. regalis*, and many other rare plants. W. L.

THE FRUIT OF THE OLEANDER.—*Nerium Oleander*, *L.*, the Oleander of common house culture, belongs to the Dogbane family, and has for close relatives such plants as the Indian Hemp, and Periwinkle, the small evergreen vine often found in old gardens and cemeteries, erroneously called myrtle. The writer has never seen the periwinkle in fruit, but the long slender pods of the Indian Hemp, that burst open at maturity and allow the seed that are furnished with copious white down to scatter, are familiar to all. Yesterday the writer was called to the house of a friend to see the fruit of an Oleander. The pods are five to six inches long and about one-fourth of an inch in diameter and grow out from the end of the twig that bore the flowers; they split open on two opposite sides and allow the seeds to fall out—or rather force them out, because the two ends of the pod draw toward each other, thus pressing the seed together did they not have a chance to escape. The seeds below the crown or tuft of down are three-sixteenths of an inch long by a third as thick; they are in this portion covered with short, stiff, brown hairs, which suddenly become longer at the top of the seed and form a tuft of down about an inch in diameter of the same brown color as the hairs on the seed. By a little pull, the top part of the tuft comes out. The seeds are obscurely attached to the inside of the pod. The weight of 50 seeds was 22 grains. Hence there would be, in one grain, 227 seeds, and in one ounce 6,422 seeds. E. E. BOGUE.

Stillwater, Okla

TWIN HAZEL NUTS.—Mr. H. G. Shelby, Burlington, Iowa sends specimens of Hazel nuts that appear as twins. They are formed by two flower buds being started on the branch instead of one, and so close together that they engraft in early infancy. This we occasionally see in the apple and other fruits. It is rare in the hazel nut. These are the first ones we have seen.

GENERAL GARDENING.

THE APPLE BLOSSOM.

As now, on some delicious eve,
We, in our sweet sequester'd orchard plot,
Sit on the tree crook'd earthward; whose old boughs,
That hang above us in an arborous roof,
Stirr'd by the faint gale of departing day,
Send their loose blossoms slanting o'er our heads. —COLERIDGE.

WATERING FORCED SPIRÆAS.—The beautiful white-flowered spiræas forced for use about Easter-tide, must be kept plentifully supplied with water while in flower. In fact, contrary to general rule, a little water in the saucers beneath the pots, or in the jardinieres, as the case may be, will be found desirable, but only sufficient to last a short time. The plants will be found to drink it up very quickly, and by observation, it can easily be determined how much to give each time.

ROCKY MOUNTAIN EVERGREENS IN IOWA.—The following extract from *Gardening* shows the value in which the Rocky Mountain Evergreens are held in Iowa. It is particularly interesting to note that the Colorado Blue Spruce as usual heads the list.:—

"The first of importance is the *Picea pungens*, or Colorado Blue Spruce. This is undoubtedly the king of spruces. We have not the command of language to express the admiration we have for this tree, which is one of the gems of the Rockies; and while it is found in the deep gorges on very dry, but exposed points on the range, one would naturally suppose that it would not endure the great changes of transplanting to the genial soils we have here. Yet, the facts are that there is no tree that so adapts itself to the prairie conditions as this one does, and it is certainly designated to be the coming ornamental evergreen tree; the person encouraging its planting will be rearing a living monument that will last for ages. Another tree the merits of which I am very fond of extolling is *Abies concolor*. This variety does not transplant quite as easily as the Silver Spruce but when once established is a revelation of beauty and symmetry. As I write this I look out upon a specimen that is fully twenty-five feet high, and if asked to describe it, the English language would fail me.

The Douglas Spruce has been denominated by a western writer as the tree for the millions, but with us it has the habit of starting so early in the spring that its growth is often killed back by late frosts, which is quite detrimental to this variety, as the leader is killed and makes the tree unshapely. Specimens on our grounds which are twenty feet high are perfect models of beauty, but as grown in nursery rows they are not so attractive and valuable as other sorts. Still another Rocky Mountain Spruce is known as Engelmann's Spruce. This often approaches in beauty to the Silver Spruce. Oftentimes specimens of this spruce can easily be mistaken for *Picea pungens* so far as color and beauty of form are concerned, but one acquainted with these conifers can easily distinguish them as the Blue Spruce has sharp needles, like pines, while those of Engelmann's Spruce are much longer and flexible.

M. J. WRAGG."

HONEYSUCKLE FLOWERS FOR CUTTING.—Try the flowers of the honeysuckle vine for bouquets, vases and general decorations, and you will find a source of great gratification. The marvellous fragrance of the flowers will fill a room. Long sprays, well covered with foliage, will make graceful decorations. The Chinese form will prove a favorite on account of the reddish foliage and red and white flowers.

ACORUS CALAMUS.—G. N. C., Oberlin, O., remarks:—"The Acorus is quite a nuisance in my Lotus ponds, crowding them, difficult to exterminate, and dying when other aquatics are most luxuriant. As an aquatic, it does not begin to compare with the luxuriant Cat-tail, *Typha latifolia*."

ROCK-WORK.—Few elements in ornamental gardening require more intelligent handling than rock-work. Well worked out, few departments, give more pleasure,—while when the feature is successfully presented to us, it is an object of delight. The rule generally is that the rocks should be so placed as to appear the handiwork of nature. But the truth is this is rarely the case. It is doubtful whether any piece of rock-work was so arranged that the hand of art was hidden successfully. This being granted, it would seem wisdom to candidly avow that it is a work of art, and to leave to it a self-avowal of the fact. Now, one of the first principles in landscape gardening art is that of harmony. A pile of rock arranged on a smooth, level piece of lawn would never be admired. A rockery never looks well except arranged where rocks ought to be. But this does not imply that art should be ignored.

The annexed engraving illustrates the point very well. We all know that these rocks have been arranged by the hand of man, and that the plants and planting have been introduced in the same way. Yet the effect is pleasing, and would be enjoyed even by the most critical in the art of landscape gardening.

ROCK-WORK GATE-POST, GROUNDS OF F. R. CHANDLER, Esq., LAKE GENEVA, WIS.
MELCHIOR LUETSCHG, GARDENER

SUMMER TREATMENT OF TRANSPLANTED TREES.—In the earth in which vegetation is growing, we can find no water, in the popular sense of the term; but the particles of earth hold moisture, which can be extracted, and condensed as liquid by the roots of plants. How this is done, no one knows exactly, but the wonderful fact remains that trees growing in ground comparatively dry, will fill their tissues with immense quantities of liquid, which is given off by the leaves to the atmosphere daily, to be continually replenished from the moisture stored in the earth-particles below. To take advantage of this store of moisture, the roots must be in actual contact with these particles. The great effort of the successful tree planter is to pulverize the earth as finely as possible, for the reason that the finer the particles the greater the amount of moisture afforded; and because the finer the particles the more closely packed it can be around the finer roots. Water, in itself, is an injury to plants. Plants suffocate if the water lie around the roots for a few days in the growing saeson. All that is needed is enough to saturate the particles of matter, without driving the air from spaces between the pulverized particles. We can see from this, that watering newly transplanted trees may be an injury, as often it may be a benefit. If a tree transplanted in the early part of the season, that has pushed into leaf, show signs of wilting in warm weather, when surrounding vegetation show no such wilting, the inference is that there is quite enough moisture in the soil, but that it is out of contact with the roots. It may have been wet weather, and the soil was too pasty to pulverize properly. In this case, a beating down with a heavy rammer,—a paving rammer even, if can be had, is of more importance than watering would be. The watering does not bring the roots into closer connection with the earth. If, after this, the leaves still seem to suffer, and there is undoubtedly a dry time as other vegetation shows, then the aid of water is acceptable to the transplanted tree.

A SHRUB FOR DRY WEATHER.—Each year the value of *Hydrangea paniculata* becomes to us more and more apparent. And in the almost unprecedented drouth of the past season, when all other vegetation was parched, the immense panicles of this shrub were fresh as ever. These blossoms may be dried for winter bouquets, the petals retaining their form perfectly, and changing only in color. BESSIE L. PUTNAM.

GLADIOLUS. — The Gladiolus is the most attractive of all the summer flowering bulbs, and deserves a place in every garden, as it is sure to flower and do well with very little care. It has no insect enemies or disease. The flowers are of almost every desirable color. By cutting the spikes when two or three of the lower flowers are open, and placing them in water, the entire spike will open in the most beautiful manner. Set the bulbs from six to nine inches apart, and about four inches deep. Plant from middle of April to first of June. It is a good way to plant at two or three different times, ten days or two weeks apart. This will give a succession of blooms from July to November. STORRS & HARRISON CO.

Painesville, Ohio.

OPEN AIR BEGONIAS.—As a rule, the *Begonia* is not suited to out-door gardening,—but the everblooming species, *Begonia semperflorens*, does well in partial shade, and keeps up a supply of flowers all summer. Florists have turned their attention to selections of varieties, and there are now several of various shades between pure white and deep red.

THE AMERICAN LOTUS.—*Nelumbium luteum.* is truly America's greatest floral giant. With its huge yellow blossoms ten inches and its bright green leaves, thirty inches in diameter, this noble aquatic easily out-measures the stateliest of its terrestrial cousin—the Southern Magnolia. It is purely American. No yellow lotus has ever been found in any other part of the world; nor has any other *Nelumbium* been found in America. In all respects, except color, it is identical with the oriental *Nelumbium*. When the flower first opens, the petals are a bright lemon yellow, but grow paler each day until almost white. It approaches the Egyptian Lotus in size and outline, except that it is somewhat more globular. Under cultivation, it behaves like the Japanese Lotus, (*Nelumbium grandiflorum*), becoming "dwarfed" and flowering more freely in limited quarters. It submits to more rough handling than any lotus; and a smaller per cent. of the roots die when transplanted. Last spring, the writer put some surplus tubers in a cement tank in which there was no soil. They at once started growth and produced an abundance of foliage with considerable flowers while floating on the clear water. My experience with other lotus' tubers, when treated thus, is, they send out a few puny leaves and then decay. Yellow is the most desired color among water lilies; and this, being the only yellow lotus, takes a place in the water garden that cannot be filled by a substitute. The American Lotus is indigenous to the south-central portion of the United States, though it was carried north and east by the early Indians, and traces of it are left as they migrated west-

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ROCK-WORK GATE-POST, GROUNDS OF F. R. CHANDLER, Esq., LAKE GENEVA, WIS.
MELCHIOR LUETSCHG, GARDENER

SUMMER TREATMENT OF TRANSPLANTED TREES.—In the earth in which vegetation is growing, we can find no water, in the popular sense of the term; but the particles of earth hold moisture, which can be extracted, and condensed as liquid by the roots of plants. How this is done, no one knows exactly, but the wonderful fact remains that trees growing in ground comparatively dry, will fill their tissues with immense quantities of liquid, which is given off by the leaves to the atmosphere daily, to be continually replenished from the moisture stored in the earth-particles below. To take advantage of this store of moisture, the roots must be in actual contact with these particles. The great effort of the successful tree planter is to pulverize the earth as finely as possible, for the reason that the finer the particles the greater the amount of moisture afforded; and because the finer the particles the more closely packed it can be around the finer roots. Water, in itself, is an injury to plants. Plants suffocate if the water lie around the roots for a few days in the growing saeson. All that is needed is enough to saturate the particles of matter, without driving the air from spaces between the pulverized particles. We can see from this, that watering newly transplanted trees may be an injury, as often it may be a benefit. If a tree transplanted in the early part of the season, that has pushed into leaf, show signs of wilting in warm weather, when surrounding vegetation show no such wilting, the inference is that there is quite enough moisture in the soil, but that it is out of contact with the roots. It may have been wet weather, and the soil was too pasty to pulverize properly. In this case, a beating down with a heavy rammer,—a paving rammer even, if can be had, is of more importance than watering would be. The watering does not bring the roots into closer connection with the earth. If, after this, the leaves still seem to suffer, and there is undoubtedly a dry time as other vegetation shows, then the aid of water is acceptable to the transplanted tree.

A SHRUB FOR DRY WEATHER.—Each year the value of *Hydrangea paniculata* becomes to us more and more apparent. And in the almost unprecedented drouth of the past season, when all other vegetation was parched, the immense panicles of this shrub were fresh as ever. These blossoms may be dried for winter bouquets, the petals retaining their form perfectly, and changing only in color. BESSIE L. PUTNAM.

GLADIOLUS. — The Gladiolus is the most attractive of all the summer flowering bulbs, and deserves a place in every garden, as it is sure to flower and do well with very little care. It has no insect enemies or disease. The flowers are of almost every desirable color. By cutting the spikes when two or three of the lower flowers are open, and placing them in water, the entire spike will open in the most beautiful manner. Set the bulbs from six to nine inches apart, and about four inches deep. Plant from middle of April to first of June. It is a good way to plant at two or three different times, ten days or two weeks apart. This will give a succession of blooms from July to November. STORRS & HARRISON CO.
Painesville, Ohio.

OPEN AIR BEGONIAS.—As a rule, the *Begonia* is not suited to out-door gardening,—but the everblooming species, *Begonia semperflorens*, does well in partial shade, and keeps up a supply of flowers all summer. Florists have turned their attention to selections of varieties, and there are now several of various shades between pure white and deep red.

THE AMERICAN LOTUS.—*Nelumbium luteum.* is truly America's greatest floral giant. With its huge yellow blossoms ten inches and its bright green leaves, thirty inches in diameter, this noble aquatic easily out-measures the stateliest of its terrestrial cousin—the Southern Magnolia. It is purely American. No yellow lotus has ever been found in any other part of the world; nor has any other *Nelumbium* been found in America. In all respects, except color, it is identical with the oriental *Nelumbium*. When the flower first opens, the petals are a bright lemon yellow, but grow paler each day until almost white. It approaches the Egyptian Lotus in size and outline, except that it is somewhat more globular. Under cultivation, it behaves like the Japanese Lotus, (*Nelumbium grandiflorum*), becoming "dwarfed" and flowering more freely in limited quarters. It submits to more rough handling than any lotus; and a smaller per cent. of the roots die when transplanted. Last spring, the writer put some surplus tubers in a cement tank in which there was no soil. They at once started growth and produced an abundance of foliage with considerable flowers while floating on the clear water. My experience with other lotus' tubers, when treated thus, is, they send out a few puny leaves and then decay. Yellow is the most desired color among water lilies; and this, being the only yellow lotus, takes a place in the water garden that cannot be filled by a substitute. The American Lotus is indigenous to the south-central portion of the United States, though it was carried north and east by the early Indians, and traces of it are left as they migrated west-

INTENTIONAL SECOND EXPOSURE

ward. It was a favorite with some tribes of the Indians, and was said to be the oldest child of the great "Father of Waters." The seeds were called "70-year Acorns," because it was supposed it took seventy years for them to germinate. They were extensively used as beads, and also as an article of food under the name "Yonker-pins." It is believed by some that the root, also, was utilized for food,—used as a substitute for the potato. Large fields of this plant were under cultivation on the middle waters of the Tennessee and Cumberland rivers at the time of the settlement by the whites.

In illustration, a beautiful picture accompanies this, of a scene in Westside Park, Paterson, New Jersey, which by kind permission of Secretary Amiraux, is taken from the 9th annual report of the Park Commissioners of that city.

GINSENG.—Much is written about the cultivation of Ginseng for the Chinese market. Has the growing of Korean, Japanese or Manchurian Ginseng been tried here? It is said to fetch a much higher price than the American article. C. W. G.

Merchantville. N. J.

A SCENE IN PATERSON PARK, NEW JERSEY

Old citizens now living in those sections can remember when the routed Indians would return and gather all the seeds they could carry away. So while the *pink* lotus of the sacred Nile and the *white* lotus of the sacred Ganges, have had their worshippers, the *yellow* lotus of the sacred Mississippi has had, at least, its admirers.

WESTSIDE PARK, PATERSON, N. J.—Landscape gardeners tell us that it takes a combination of earth, sky, land and water, to form a perfect picture of the landscape gardeners' art.

STUARTIA PSEUDO-CAMELLIA.—In looking over your interesting MONTHLY for January, I notice an error has crept in someway, in the translation on *Stuartia*, page 10, where the height of *S. Pseudo-camellia* is given as 15m.—about 50 feet—which would be quite a tree. I find that good authorities give the height of this shrub as 4m.— that is 12 or 13 feet.

Rochester, N. Y. E. W. SEELYE.

A DOZEN GOOD DOUBLE GERANIUMS.—Recently I gave names and descriptions of twelve best single geraniums; now I enumerate twelve

—or rather fourteen—double varieties. Double garaniums, as a rule, almost invariably last longer when cut—in fact, that is my experience. They lack, however, that beauty of simplicity so noticeable in single varieties. The varieties enumerated are all superb and leave nothing to be desired as to habit of growth, freedom of bloom and robustness of constitution.

NAME.	COLOR.
Modesty.	Beautiful Shell Pink.
Marvel.	Crimson-Scarlet.
Henri de Parville.	Bright Magenta with distinct white eye.
Gen. Des. Boisdeffre.	Salmon-striped Scarlet and veined with White.
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Raspail Improved.	Scarlet. First-class.
Paul Barre.	Bright Pink with white-eye; vine.

Anyone growing say half-a-dozen of the several varieties above mentioned together with half-a-dozen each of the singles enumerated previously, can have geraniums, and plenty of them, all winter long. We have gathered a few trusses almost every other day all winter long and to-day, March 8th, there are lots left. Give them a good watering of liquid manure once a week, and dont be afraid to stop them (if they are inclined at all to become long) thereby inducing a strong, short, bushy specimen, which is the most desirable plant.

Rahway, N. J. A. P.

NEW OR RARE PLANTS.

NEW GIANT CACTUS DAHLIA.—Mrs. Theodosia B. Shepherd, Ventura, Calf., who has already come into prominence by her improvements in the flowers of the *Cosmos*, is deserving of further recognition for the production of certain new Dahlias. One of the latest named "Monarch of Dahlias," is thus described:—"Intermediate between the double and Cactus varieties. The flowers are large, loose, very æsthetic in form and measure six or more inches across; the petals are very broad; color deep, rich, dark red, having a beautiful bloom like velvet; flowers are borne on long stems, and are fine for cutting."

DAHLIA TRIFURCA.—The *Dahlia trifurca*, with eccentric ligules (straps),—you know the *ligules* are the petals composing the radius,—presented by M. Ch. Molin to the Horticultural Department of the Lyon's Association, is very singular. Those three pitchforks are not useless;—did I say three pitchforks? There are six, seven,—in fact, as pitchforks, they are numberless.

But are these all well formed pitchforks? There is one which looks like a trident; another is not unlike the halbert of the Swiss of Saint Pothin; indeed, it seems to me the cruel Archer might have been able to find some bits of his flesh in the cup. *Trifurca!* It is sonorous, but as for its name that scents strongly of Latin,—and Latin which is needless. But if it must be so, it could just as well be *tridentata*, *trifida*, *hastata* (halbert), or *sagittata* (arrow).

Since Latin is not necessary for describing horticulturally, the varieties of plants, the dahlia in question has been baptized as Neptune's Trident. This baptismal name might have been longer, it is true, but it has the merit of teaching mythology to children in calling their attention to the name of a fabulous personage.

But let us proceed. The *Dahlia trifurca*—or trifida—is really a *Dahlia* with a curious form, whimsical and singular; one of the kind of which M. Hoste might have said, "You know it is necessary that some should be like that, but there is no need of so many!" M. Hoste was a man of excellent taste of whom one could be proud to have judge of the horticultural merits of a variety.

Its color is not "golden and red," as one sings in *Galathée*, but an amaranth-red on the inside, with an edge of velvety purple; on the outside it is of a carmine-pink. Its disk flowers are of a golden yellow.

While speaking of Dahlias, I wish to mention a very remarkable variety of which there is a sketch in the present number of this review, and for which we are indebted to M. Molin. He describes it under the name of Pearl of Fire. This kind is distinguished from all others by its short stature, great precocity,

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stocky or stubby growth ; the flowers expand in great numbers at a time, of a color which its name seeks to designate, but more especially from the form of its flower, which seems to hide itself evasively in its chalice. It might be called a plant of " massiveness," according to the expression of M. Jules Christian.

Its color is a purplish, bloody red, with a dull heavy red reflection. The contrast of these two shades is very pleasing.

—From *Lyon-Horticole.*

THE HARDY FLOWER GARDEN.

SAXIFRAGA CRASSIFOLIA.—One of our prettiest hardy herbaceous plants is *Saxifraga crassifolia*, of which the illustration annexed, from *La Semaine Horticole*, gives an excellent idea. The flowers are of a pale rose color. Our contemporary announces that a selected

SAXIFRAGA CRASSIFOLIA.

variety has been put into the English trade, that has flowers of a reddish purple tint. It will appear in catalogues as *Saxifraga crassifolia*, variety *purpurea*.

Saxifraga cordifolia is a very common synonym of *S. crassifolia*.

PROPAGATING CHOICE HOLLYHOCKS.—Directly the seedlings of the hollyhock appear above ground, the pots should be placed on a shelf, near the glass, and when they have emerged into the rough leaf they must be inured to coolor conditions. The choice varieties are mostly increased by cuttings, and to do this readily the stools should be afforded a temperature of 50° by night, and 60° by day. As soon as the shoots are long enough, that is, about 3 inches, remove them off with a heel of older growth, and place each singly in a small pot in light sandy soil, with a pinch of sharp sand at the base. Afford water, and after plunging the pots in a bottom-heat of 70°, cover the cuttings with a hand-light or big bell-glass. Much care must be exercised in preventing damping, by removing condensed moisture from the glass, and water should be sparingly used.—*Gardener's Chronicle.*

TO DESTROY ROSE-LEAF INSECTS. — The small whitish insects which suck the life out of rose leaves are rose-hoppers which are frequently found on the lower side of the leaves. It is said that if attended to before they are fully developed they can be easily destroyed by dusting the infested plants with Slug Shot. When fully grown they are very persistent, and several applications have to be made in order to kill them, and even then absolute riddance is doubtful. Aphides propagate so quickly, and in numbers so marvelously great, it requires close attention to keep plants moderately free from them. The secret is to commence at first sight of them, or perhaps before they arrive,—for there are very few plants that are not attacked before the season advances very far.

FRUITS AND VEGETABLES.

SPRAYING HINTS.—The following valuable hints are extracts from the catalogue of The Deming Co., and will be found worth remembering :—

" *The Amount of Loss in Crops* from injury by insects and fungi in the United States alone, is estimated by the highest scientific authorities at $500,000,000. Seventy-five (75 per cent.) of the amount (or $375,000,000) can be saved by spraying.

The Principal Fungicide is the Bordeaux Mixture. For the application of fungicides all the working parts of a pump must be made of brass, since the corrosive action of these liquids is very injurious to iron.

Before Using, a Spraying Outfit, the operator should first examine the suction pipe and strainer, the discharge hose and connections, and the nozzle, to see that everything is in good working order. First try the pump with clear water to see that there are no leakages.

After Using, the Spray Pump, hose and nozzle should be made perfectly clean by pumping clear water, and by washing the outside as well, if the mixture has discolored them. Never take a spray pump apart unless it is necessary, and when apart, care should be exercised in putting it together.

An Efficient Agitator for orchard work is absolutely necessary. Without this not only do the valves and nozzle soon become clogged, but the liquid settles to the bottom of the barrel. This latter causes an uneven application of the liquid, it being too strong at the beginning and not strong enough at the close of the spraying. Using an application of too great a strength will be apt to damage the foliage, while using too weak an application will accomplish but little or no benefit.

Knapsack Sprayers. From a theoretical standpoint it is generally taken for granted that the Knapsack Sprayers do not need an agitator, as the motion of the body will tend to keep the liquid stirred. This is a great error, as all know who have had much experience in the use of a Knapsack Sprayer.

The Nozzle is the Essential Feature of any Spraying outfit. However well made the pump may be, if the nozzle does not throw a fine mist-like spray, the outfit will not give satisfaction."

The above mentioned firm are distributing Weed's " Spraying for Porfit" at ten cents per copy. It is a little pamphlet of seventy-two pages, suitable for carrying about in one's pocket. The condensity of the work, which aims to cover simply the more important facts, makes it valuable to the sprayer.

PROPER CULTIVATION OF ORCHARDS.—The annual address of President S. B. Heiges, before the Pennsylvania State Horticultural Association, at the Pittsburg meeting last January, abounded in important facts for the fruit grower, tersely put and directly to the point. He urged the desirability of cultivating orchards from the beginning, prohibiting sod. Roots are marvellous travelers in their search for food, and will almost always run towards the surface in sod. While moisture is plentiful, this may not be harmful ; but in times of drought, the results are serious to these surface roots. Cultivation wont make wood-growth ; it simply paves the way, making food more accessible. Ammonia (nitrogen) is the wood-producer, and is best in the shape of good stable manure. Don't pile it around the trunks of the trees ; the feeding roots are young ones, far out from the trunk. Roots usually run out at least as far as the branches spread, which will be a good guide, showing the more important portions to fertilize. Potash and phosphoric acid are food for fruit, and may be obtained in bone meal or wood ashes. Observe your trees and take note of their apparent needs, applying fertilizers judiciously.

STRAWBERRY CULTURE. — J. W. Allison, Mercer, Pa., says that the strawberry's greatest need is moisture, nitrogen, phosphoric acid and potash. To produce the nitrogen, he recommends growing Crimson clover first where the plants are to stand, plowing it under. The deep roots of the clover thoroughly supply the soil with humus. His plants are set 1½ to 2 feet apart in rows, 3 to 4 feet between the rows; but they are permitted to run freely on the matted-row system,—of course, not permitting them to crowd each other. Each year, as needed, the plants are thinned until in a few years the entire bed is turned under, with a new one under way. Thorough cultivation, to conserve moisture, is recommended, with a good mulching of straw in winter.

BOX-CULTURE OF WATER-CRESS. — People often sigh for good, fresh water-cress, not knowing it to be easily cultivated with or without a stream. Of course, it is more at home in a stream, and will grow more regularly, and luxuriantly, without any care. But, supposing the stream is not at hand, take a box or flat about four inches deep, and any convenient width and length. Fill with rich, light loam ; soak it with water and sow the seed right on the surface. It may be covered very thinly with fine soil ; but as the seed is small, there is danger of getting too much on, in which event, none would be better. Place the box in

partial shade to prevent drying out, and keep watered every day, or as found necessary to have it always moist.

The writer recently raised two boxes this way. The plants in one were left to mature in the box; those raised in the other were transplanted to a clear, swift-running, narrow brook, about the time they made their second pair of leaves. They were dibbled in where the water was about an inch deep. Grass overshadows this little stream from a spring, and the plants quickly grew and are spreading.

Water-cress is a perennial, and in picking it, it should be pinched off and not pulled. Some young neighbors of the writer's quickly depleted a fine supply several years ago.

APPLES FOR SAUCE-MAKING. — Maiden's Blush and Fall Pippin apples are most excellent varieties for sauces. The last named has a remarkably fine grain, cooks up quickly, making a soft, juicy sauce.

SMALL FRUITS IN MINNESOTA.—Prof. S. B. Greene, of the Minnesota State Experiment Station, has the following to say regarding trials of raspberries in that State:—

"We regard the Loudon as our best red raspberry.

Marlborough has never been productive on our land, although on heavier and better soils it does remarkably well.

The Cuthbert has some years done remarkably well here.

King is an early red raspberry which makes a strong growth and produces a large amount of fruit early in the season, but we do not regard it superior to Loudon.

Turner is the best for general planting of the older varieties, and is very hardy. And although the fruit is somewhat soft, yet it is still a very desirable variety for planting in the home garden.

Columbian is a wonderfully strong grower and very productive and bears large, purplish red fruit. It seems to have great vitality and the power of producing a large number of fruiting laterals from near the surface of the ground in case the top of the plant is injured,—a quality which is very desirable. It is well adapted for home use.

Nemaha is our best black cap raspberry. It is difficult to distinguish it from the Gregg, but I am disposed to regard it as being hardier, although there is very little difference between the two.

Progress is a very good early black raspberry."

Blackberries and Dewberries. "As yet we have found nothing that combines as many good qualities as the Ancient Briton, and this variety is very superior on our land to any other that we have tried. The fruit on the Snyder ripens earlier, but the plants do not produce more than a third as much as the Briton. Stone's Hardy has been so very unsatisfactory on our land that we have taken up and thrown away all the plants of it that we had formerly growing here."

"We have never succeeded in fruiting the dewberry except in but one season, when it yielded far better than any of our blackberries. All the varieties tried would flower well in the spring, but they failed to set fruit. At one time it was recommended to set them near to the blackberries, looking to aid by cross-fertilization, but our experiments have not resulted in any material gain."

Gooseberries. Houghton, Downing and Pearl gooseberries give best results. All large fruiting kinds except Columbus are practically discarded as not doing well.

Currants. The following have proven the most valuable:—Red Dutch, Stewart's Seedling, Victoria and White Grape.

CHERRY CURRANT AND YELLOW SPANISH CHERRY.—Mr. L. Woolverton, Grimsby, Ontario, Canada, is an authority on Canadian fruits, and has the following to say regarding two well-tried kinds:—

"*Yellow Spanish Cherry.* Of all the Bigarreau cherries this is one of the finest, both on account of its great size and its delicious flavor. The tree grows to a very large size, surpassing in this respect all other cultivated varieties with which we are acquainted. It does not average very productive, because the fruit often blasts and drops, or is destroyed by Monilia. When, however, it does mature a good crop, the yield is enormous.

Cherry Currant. The principal red currant grown in Southern Ontario for commercial purposes. Its large size, fine color and earliness, combine to make it the most satisfactory of all varieties for market. When well cultivated and well pruned back, a plantation of cherry currants will continue very productive for at least twelve or fifteen years."

TO PREVENT APPLE TREES FROM BEARING.—It is a common occurrence to receive inquiries on the subject of bringing fruit trees into bearing; but very few want to know of a preventative. A correspondent has a tree producing a sweet apple which is undesirable for fruit, but very much thought of for its shade. In such a case, only suggestions can be made, with no surety that a "cure" will result. It is often noticeable that trees growing very rapidly do not bear very much—perhaps not at all; great vigor and fruiting do not generally go together. Therefore, a liberal supply of stable manure would encourage stronger growth and possibly affect the fruiting.

CULTIVATION OF THE WHITE STRAWBERRY.—A correspondent inquires if there has ever been an effort to domesticate the Wild White Strawberry. The wild strawberry of the Pacific Coast, *Fragaria Chiloensis*, is white, and has long been under cultivation; but, not bearing as freely as the Scarlet or Eastern Wild Strawberry, it is not much planted. Occasionally, a plant of the scarlet strawberry is found bearing white fruit. There can surely be nothing against its successful cultivation if desired.

SEA KALE.—When properly blanched, this is a delicious vegetable. Though taking labor to properly secure it, it is worth the trouble in high class amateur gardens. Seeds sown in very rich ground early in spring, will make strong roots by fall. These, carefully dug and set closely in boxes of earth, can be placed in a cellar, or any dark and somewhat warm place, and will make good material for cutting during the winter season.

SMALL FRUITS IN YOUNG ORCHARDS.—The careful gardener makes all the use possible out of the land at his command, and the young orchard gives an opportunity for the exercise of economy and judgment to make it yield something while the trees are coming to the bearing period. Cultivation is the watchword for an orchardist, and the growing of crops that need cultivation, between the rows makes cultivation more of a necessity. Mr. W. B. K. Johnson, Allentown, Pa., practices this to a considerable extent, strawberries and raspberries being of his principal crops. He finds it profitable not only in the way of cultivation to his orchards, but in the value of the additional fruits thus obtained. He finds that even where the plants run quite close to the trees, the yield is good, though there is, of course, some difference. Early bearing fruits, such as peaches, plums and dwarf pears, may also be grown between the main rows of trees, to be taken out as the others make it desirable.

LEAF BLIGHT IN THE PLUM.—There is no part of the world free from "the thorns and thistles," which make the "sweat of the brow" necessary for successive fruit culture. When new localities are established, it takes time for enemies of the insect and fungus character to find them out. But the discovery is made eventually, and the "fungus-proof" and "insect-proof" varieties finally succumb. The heretofore favored land of California, is being rapidly invaded. The leaf-blight on the plum, one of the worst foes of the fungus character to the plum grower of the eastern portion of the United States, has invaded the west. In Butte County, a Californian paper tells us, the leaves of whole prune orchards had mostly been destroyed by the 1st of July.

TOMATOES AS MEDICINAL PLANTS.—It appears that a Scotchman, after an experience of several years, is convinced that the daily use of tomatoes is an excellent remedy for liver troubles. In America, also, the use of the tomato is considered as a remedy, and prized very highly as a strengthener, and for purifying the blood.—*La Semaine Horticole.*

LEAF BLIGHT IN THE STRAWBERRY.—The last generation found benefit in mowing and burning strawberry leaves after the fruit gathering. Science objected that it could not be good practice because leaves were essential. It is now known that strawberry plants suffer from a fungus known as the "spot." Burning the leaves before the spores matured was a good point science did not see. The fungus did more injury than the old leaves did good. Copper solutions now dispense with mowing.

BIOGRAPHY AND LITERATURE.

THE GARDENER'S HAND.

It is not much that to the fragrant blossom
The ragged brier should charge, the bitter fir,
Distil Arabian myrrh!
Nor that upon the wintry desert's bosom,
The harvest should rise plenteous, and the swain,
Bear home the abundant grain.

But come and see the bleak and barren mountains,
Thick to their tops with roses; come and see,
Leaves on the dry, dead tree:
The perished plant, set out by living fountains,
Grows fruitful, and its beauteous branches rise,
Forever, towards the skies.

BRYANT.

MUSHROOM CULTURE.—An instructive little pamphlet, entitled, "Mushrooms for the Million," a reprint of a paper recently read by Mr. George C. Watson, Philadelphia, before the Southampton Farmers' Club, Somerton, Pa., is being distributed by the author. In a most interesting manner, it explains the nature and growth of mushrooms, and in brief form, the essential points regarding their culture,—not particularly to benefit the commercial grower, but rather the one who grows to supply his own table.

VEST-POCKET GUIDE TO CULTURE OF FLOWERS.—A remarkably handy little booklet under the above title has been issued by Messrs. W. Atlee, Burpee & Co., Philadelphia, which gives, in condensed form, the most valuable points to be considered in preparing flowerbeds and sowing seeds.

TEXAS BOTANY.—We all know what happened to the birds that rose early. Botanical explorations have not profited much by this old proverb. The mass of plants in little known regions are in full flower or fruit before the collector starts in search of them. But some botanists are acquiring wisdom. On the 13th of March, Sargent, Canby and Trelease, set out for a collecting trip to Texas. They will return with volumes of information former botanists were too late to get.

LINNÆUS.—Botanists will be glad to learn that a full length portrait of the father of modern botany has been presented to the Academy of Natural Sciences of Philadelphia, through the generosity of Mr. Charles E. Smith, an eminent amateur botanist of the same city. It is well known that an original portrait of Linnæus was somewhere in existence, but no one knew where. Mr. Smith had an active search made, and the picture was discovered to be in the possession of Baron Verschuer, and in his country home at Verschuer, near Haarlem, twenty-three miles from La Hague. By the generous consent of the Baron, an artist of eminence was engaged to take a copy of it,—and it is this copy which is now among the most valued of the treasures of the famous Philadelphia Academy.

In presenting the gift to the Academy, Mr. Smith remarked:—

"There are two remarkable blunders in the picture. The second scientific trip of Linnæus' life was to Lapland. On it he discovered *Linnæa borealis*, described and named after him by Gronovius, the common name of which is twin flower, because each stem bears two flowers. Linnæus loved this plant very much. When he was ennobled by the King of Sweden, he chose *Linnæa* for his crest.

Stockholm stands on a number of rocky islands, some of them quite small. One of them is called Ritterholm, the Knights' Island. When I was there in 1850, there was but one building on it, called the Ritterholm Kirk—the Swedish Walhalla. It contains statues of all the great men of Sweden, among them Linnæus. It is of white marble. He stands with an open book in his hand, on its page is an outline of *Linnæa*.

This picture represents him holding in his right hand two specimens of *Linnæa*, a tall one and a short one. The tall one has three flowers and the short one only one, so that neither of them is a twin flower. The leaves of *Linnæa* are orbicular-spatulate, very obtuse and coarsely toothed. In the picture they are ovate-cordate, acute and entire. That the artist should have thought that one weed looked just like another is natural enough, but that Linnæus should have overlooked these errors in his favorite plant is very strange."

ISAAC HICKS. — In his eighty-fifth year, passed away Isaac Hicks, of Westbury, Long Island, who was not only the founder of the Westbury Nurseries, in 1853, but had considerable reputation as an artist and in general science, in which his love for botany was very conspicuous. He was for many years a member of the American Association for the Advancement of Science, and was always welcomed at the meetings by his fellow-members.

E. S. CARMAN.—On the 28th of February, passed away Mr. Elbert S. Carman, the editor and proprietor of the *Rural New Yorker*. He was born in Long Island, and came into possession of the *Rural New Yorker*, twenty-four years ago. Besides being a leading authority on agricultural affairs, he was eminent for his love of flowers and gardening. His death brings with it sincere regret over a wide circle of friends.

THE PHYSIOLOGY OF PLANTS, A TREATISE UPON THE METABOLISM AND SOURCES OF ENERGY IN PLANTS.—By Dr. Wm. Pfeffer, Professor of Botany in the University of Leipzig, second revised edition, translated into English by Alfred J. Ewart, from the *Clarendon Press*, Oxford.

This is a beautifully illustrated work of some six hundred pages. Dr. Pfeffer, the German author, is among the leaders in vegetable biology. The publication of this work marks an era in the history of botany. It does not cover the ground occupied by Sach's Text-book,—but is far more exhaustive of the special branches of which it treats. It will be an essential volume in all of our higher schools and colleges,—and the individual student of vegetable life will need it for his reference library. A rare merit—very rare in works of this character—is the absence of abstruse technical terms that so many learned writers love to indulge in. Where necessary, they are in use, as they should be; but there is no redundancy; and an especial feature is the pleasing system of apt illustration employed by the author, and the translator must share in this praise for the admirable manner in which he has preserved this lucid style.

THE SHAMROCK.—Referring to the note on the Samrock, page 48, a correspondent says:—"Bentham's British flora, under *Trifolium repens* says, 'In Ireland, believed to be of comparatively recent introduction, although it is now taken as the national emblem, in substitution of the wood sorrel, *Oxalis*, which was the original shamrock.'"

The botanical name was seen to be doubtful, but was retained because the paragraph was a quotation for which the original publication was responsible. It should have been *T. repens*.

After all, it is probable that the whole story of St. Patrick having converted an Irish king to a belief in the doctrine of the Trinity by the use of a three-leaved plant, is to be classed with the story of his punching a snake with his staff, and that the whole race of serpents died out in consequence. There is little known of St. Patrick, except, what he wrote of himself. The value of a man's life, is not often fully understood till long after he has passed away. It is success that succeeds. It was many years after St. Patrick's death before his work was fully appreciated. Even the place of his burial was unknown and unsought for nearly six hundred years, when it was accidently discovered, and the remains honored. Writers have mostly been dependent on the traditions of many generations in preparing his life.

The facts seem to be that the only plant that could have been used in Ireland, in the fourth century, for such an illustration, must have been the *Oxalis*. On the other hand, so far as we know, the only plant that has ever been used in the national celebrations of St. Patrick's Day, is the clover, and clover it will ever be.

GENERAL NOTES.

GARDENER TO THE KING OF THE BELGIANS.—The famous gardens at Lacken, near Brussels, owned by the King of the Belgians, and laid out by an English gardener, Henry Knight, was recommended by the Editor of the *Gardener's Chronicle*, and not by Queen Victoria, as stated in our January issue,—so a well informed correspondent writes.

PINE LEAVES OR "NEEDLES."—The *California Fruit Grower* tells us that pine needles are being utilized in South Oregon. The needles are boiled and then run through horizontal wooden rollers which extract the juice. This is called pine needle oil which is supposed to possess medical properties. The pulp is used as a medicated material for upholstering, and is also said to be a good substitute for horsehair. It is said that insect pests will not live in furniture that has been upholstered with pine needles.

AN AGED YEW.—"Beside the weather-beaten church-tower (Selborne, England,) stands the venerable tenant of the cemetery, a yew-tree so old that it is respectfully mentioned in the Domesday Book. Tradition gives it twelve hundred years; and amazingly young and vigorous it looks, and its mighty branches make a grateful shade on a summer's day."

MRS. JOHN LANE, in *Lippincott's*.

PAMPAS PLUMES FOR PARLOR DECORATION.—No prettier decoration for the parlor can be found than a large vase of pure white Pampas plumes. Plumes with long stems should always be secured, as this permits them to spread apart more in the bunch and fluff out to their full beauty; they should be from two to two-and-a-half feet long. Some decorators, with perhaps a mistaken idea of beauty, attempt to color the plumes by dipping them in various colored dyes; but to the writer they cannot begin to compare with the soft white color which nature gives. The Pampas should not be confused with Eulalia, though it is not infrequently. The plumes of the latter are a dull brown, and very much smaller. One of the great points of satisfaction lies in the fact that no water is required in the vases if the plumes be thoroughly dried or cured before taking into a warm room.

BEET SUGAR IN THE UNITED STATES.—After years and years of prompting by serials similar to MEEHANS' MONTHLY, The Beet Sugar Industry is becoming one of the staple institutions of the United States. If sugar be admitted duty free from the Sandwich Islands, it is doubtful whether the Beet Sugar investments in our country would be profitable.

THE SCALE-EATER.—The insect *Vedalia cardinalis*, introduced to California to feed on scale insects, has succeeded so well in its work that there is nothing left for food,—and they are now in danger of disappearing through starvation.

BACTERIA.—A magazine devoted to scientific topics, sagely remarks that the bacterium has something else to do in the economy of nature than in originating maladies. It continues the topic by noting a paper in a French magazine by M. Matruchot, on the agency of bacteria in forming the colors of flowers. It is something to check the microbean craze of the popular press in regard to the supposed viciousness of these humble vegetable organisms. It is true that they are operating in innumerable directions,—but the number that are associated with disease are very few,—and even these few, if the animal be healthy, are digested by the gastric juice as easily as would be an oyster. The majority, indeed, are essential to our health and happiness.

AZALEA VISCOSA.

AZALEA VISCOSA.

SWAMP HONEYSUCKLE.

NATURAL ORDER, ERICACEÆ.

AZALEA VISCOSA, Linnæus.—A shrub four to eight feet high, usually much branched, the twigs hairy. Leaves obovate-oblong to oblanceolate, two to four inches long, very short-petioled, obtuse and mucronulate or acute at the apex, narrowed at the base, glabrous or with a few scattered hairs above, more or less bristly-hairy on the veins beneath, ciliolate, green on both sides; flowers white, fragrant, later than the leaves; pedicels glandular; corolla one and a half to two inches long, the limb one to two inches broad, more or less two-lipped, much shorter than the slender, very viscid, densely-glandular tube; capsule five to seven lines high, glandular-bristly. Britton and Brown's *Illustrated Flora of the Northern United States, Canada and the British Possessions.* See also Gray's *Synoptical Flora*, Chapman's *Flora of the Southern United States and Canada*; Wood's *Class-Book of Botany.*

Starting with Maine and gradually reaching Ohio, this interesting wild flower passes down through all our Atlantic seaboard States to Florida and Texas. Its sweet-scented, white flowers make it a familiar favorite throughout the whole territory in which it is found. It seems to have been the first of our azaleas to become known to the botanists of the Old World, having been introduced there by David Banister. A very good wood cut, from Banister's specimens, appears in a book of illustrations by Leonard Plukenet, issued in 1691. Plukenet supposed it to be a species of *Cistus*, and he figures with it the *Kalmia latifolia* as another species of the same genus. The *Kalmia* he makes *Cistus sempervirens*, while our *Azalea* stands as *Cistus Virginiana*. Plukenet notes, from Banister, that the form of the flower and its odor remind one of the English Woodbine, or Honeysuckle. We see, here, how the American common name of Honeysuckle was derived. In the reorganization of botany, Linnæus founded the genus *Azalea*, and designated this species as *Azalea viscosa*. His knowledge of the plant was mainly derived from the collection and reports of his pupil, Kalm, to whom he dedicated the allied genus *Kalmia*.

In earlier times, flowers served the purposes of our modern almanacs, as the poet expresses it:—

In every copse and sheltered dell,
Unveiled to the observant eye,
Are faithful monitors which tell,
How pass the hours and seasons by.

The green-robed children of the spring,
Will mark the periods as they pass,
Mingle with leaves Time's feathered wing,
And bind with flowers his silent glass.

Our Swamp Honeysuckle served this useful purpose with the early Hollander settlers in New York. Governor Colden tells us that this was Pinxter-bloom with them,—Pinxter being their pentecostal festival, our Whitsunday. The Swamp Azalea served a double purpose in this emblamatic language. Whitsunday was the great baptismal day in the Christian churches, and the postulants were dressed for the ceremony in long, flowing, white robes. The name Whitsunday is derived from the white vestments so common on that day in the baptismal ceremony. Whitsunday being the seventh Sunday after Easter, brings that festival frequently in the early part of June, which is the time for the first appearance of these flowers in the State of New York. The pure white flowers were timely and suggestive,—and, possibly, may have been used in the floral decorations provided for the ceremony.

It is to be regretted that more attention is not given to as much accuracy in the history of common names as in the case of botanical ones. They often give instruction to be afforded in no other way. Modern authors, notably Britton and Brown, from whose work the admirable description of the plant is taken, give to *Azalea nudiflora*, the early flowering or Wood Honeysuckle, the common name of Pinkster-flower. It is out of bloom by Whitsunday, and a little thought would suggest that it could have no claim to the name But the statement of Colden, the Governor-botanist of New York, positively decides the case.

COLOR PLATE

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COLOR PLATE
INTENTIONAL SECOND EXPOSURE

It is worth noting that there are numerous varieties of *Azalea viscosa*, some of them so distinct that special botanical names have been given to them. Thus we have *Azalea viscosa odorata*, *A. v. villosa*, *A. v. fissa*, *A. v. floribunda*, *A. v. glauca*, and many others. These not only vary in the habit, foliage and flowers, but also in the time of flowering. Aiton, in the *Hortus Kewensis*, notes, from observations made on plants growing in the Royal Gardens, that it was the varieties *floribunda* and *glauca* that flowered in June,—the others reserved their attractions for July and August.

Numerous authors, treating of the *Azalea*, seem doubtful whether *Azalea viscosa* may not be divided into several species; but seem to confine themselves to giving the forms distinctive names as marked varieties. Dr. Asa Gray, in the "Synoptical Flora," retains the *viscosa glauca* of Aiton, and adds *viscosa nitida*, to which he refers the *Azalea nitida* of Pursh. Britton and Brown have one variety, *viscosa hispida*, to which they refer *Azalea hispida* of Pursh,—while Dr. Gray refers this very *hispida*, of Pursh, to Aiton's *viscosa glauca*. The student will observe from this that what is to be regarded as a species, and what but a mere variety, has no stable basis. It is but the opinion of an expert,—an opinion varying, as in the case of experts generally, with the character of each one's personal experiences. It is not possible, therefore, to have the nomenclature of plants absolutely unchangeable. The stable nomenclature so much desired is impracticable.

This difficulty has been found in the generic name as well as in the specific names. *Cistus* would never do. Linnæus founded the family *Rhododendron*, with flowers campanulate, and ten stamens,—and *Azalea* with somewhat tubular flowers and five stamens. Later botanists, noting these characters to vary somewhat, drop *Azalea* altogether as a generic term, and make all Rhododendrons. Dr. Torrey prominently started this combination. Dr. Gray seems to have been reluctant to follow his early master. His "Manuals" kept up *Azalea* as a distinct denomination, and only when preparing his "Synoptical Flora," did he follow. Britton and Brown still retain it, as seen at the head of this chapter. This latter decision seems the most judicious. If the characters of the species overlap, so that one can scarcely distinguish one from another, we may expect the same phenomena in the generic characters. It would not be philosophic to say there are no good species because the lines of demarcation are not clear,—and no more so when the same difficulty is found in the generic ground. Azaleas and Rhododendrons will always be distinct in popular estimation, however they may be united in strictly scientific treatment.

It is more than probable that the living plants introduced into British gardens were through the instrumentality of the famous John Bartram, who was the collector for Peter Collinson, who is credited in garden history as the first to cultivate it in the Old World. It is a remarkable fact, observed not only in the case of this *Azalea*, but of other plants that in nature seem to be swamp-lovers,—that they thrive to better advantage when transferred to cultivation than when growing in a wild state. The explanation given is that the seeds require moisture—or rather a damp, cool situation before they will germinate,—and, of course, the plants have to remain in the spot on which the seed sprouted. Those who take a broad view of harmony in nature look on this fact as a wise provision for insuring to swamps a due proportion of the vegetable kingdom.

The viscidity of the flowers has attracted the study of the teleologist. One of the most valuable of the discoveries of Darwin, was that the viscid glands of the *Drosera* or sundew secreted a digestive fluid. Further, it is the basis of the doctrine of natural selection elaborated by this great man, that the functions of plants were exercised solely for their own good. It would be legitimate to construct from this the broad theorem that all viscid glands in plants aided nutrition by absorbing and digesting nitrogenous compounds. The sticky flowers of *Azalea viscosa* certainly catch and retain small insects.

The specimen selected for illustration shows markedly the tubular corolla, and strongly exserted stamens and styles so distinctive of *Azalea* as against *Rhododendron*,—and the whole character exhibited justified the early settlers in bringing to their minds the sweet Honeysuckles they left behind them in their early homes.

EXPLANATION OF THE PLATE.—Specimens of the flowering branches gathered in New Jersey in July.

WILD FLOWERS AND NATURE.

THE TULIP TREE.

——The Tulip Tree high up,
Opens, in airs of June, her multitude
Of golden chalices, to humming birds,
And silken wing'd insects of the sky.
BRYANT.

THE LEBBEK TREE.—Poets have had so much to say about the beauties of Arabia, that one might almost believe it is Paradise itself. We have heard of the land of "Araby the blest," "the glorious perfumes of Arabia," where "the Acacia hangs her yellow hair," and no end of praise for "Araby's green sunny highlands," till it would seem our country was depauperate in comparison. Arabia, Egypt, and neighboring countries, have, indeed, but a tithe of the blessings nature has bestowed on us,—and it is but the poet's license that has made them great.

These reflections are suggested by a beautiful picture of a grove of Lebbek trees taken from a scene near Cairo, in Egypt, and which, by the permission of the United States Department of Agriculture, has been copied from Circular No. 23, Division of Botany. It is, botanically, *Acacia Lebbek*, and is the species that "waves its yellow hair" of Moore's beautiful poem; and the tree that, from March to June, in that country, fills the air with the spicy odor, on which the poets have based Araby's fame. With the exception of poplars and willows, and a few pines and cypresses on the mountain tops, it is about the only tree that can properly be so-called native to those regions, for dates and other palms can scarcely fill our idea of ornamental trees,—while figs and mulberries are cultivated fruits and not features of nature's own scenery. Even the Lebbek is not much of a tree, reaching but the height of an extra-grown denizen of an American apple orchard.

THE LEBBEK TREE.

The flowers are globular, and appear in the axils of the leaves,—but a striking peculiarity is in the long stamens that, on the pendulous branches, render the expression "the acacia waves her yellow hair" very appropriate. Its delightful odor has made it welcome in gardens where the frost does not appear; and it is now a favorite in all the sub-tropical regions of our globe. A spiny species, *Acacia Farnesiana*, a grower nearly as large as this, and also with

sweet flowers, growing in Florida and in the warmer parts of California, is also found wild and cultivated over most of the world's sub-tropical area,—though, strange to say, its native home has never been discovered.

It has often been remarked that, though fragrance—and, indeed, odor in all its forms—is given to flowers to attract insects; in most families, but a few species are odoriferous,—to human senses, at any rate. *Acacia* is a remarkable example. Though some five hundred species are recognized by botanists, scarcely a dozen can lay claim to being sweet scented.

Laebek is the common name in Arabia,—and, as Lebbek, was adopted by Willdenow as the specific name.

WHY THE ARBUTUS AWAKES. — April 8, 1900, was bright, clear and windy. Arbutus was noted in bloom, the first for the season. I had a thermometer with me in the woods, and took some temperatures. The instrument, resting on a mat of Arbutus, under partial shade, registered 77°; at the foot of a tree, in partial shade, 76°; at the foot of another tree, but on the north side, fully exposed to the wind, 64° when the wind was blowing hard, and 65° to 66° when the wind temporarily ceased to blow. Elsewhere in a sheltered place, among the fallen leaves, in full, bright sunshine, I obtained a reading of 114°!

At points about six feet above the ground, in sunlight, I found the temperatures to be 68° and 69°; and on the north or shaded side of an oak tree, six feet from the ground, 64°.

Comparing these several readings, it will be seen that the day's temperature was about 64°, and that this temperature was carried by the wind in one case to the surface of the ground; but that in all other cases the soil was covered by a heat blanket, and that in one peculiarly favored spot a tropical heat was present.

The Arbutus buds, dormant during the winter, quickly respond in the earliest spring to the influence of the sun. It is not strange that a warmth of 114° should cause the flowers to open quickly. S. EDWARD PASCHALL.

Newfield, N. J.

EARLY SPRING FLOWERS IN NORTHWESTERN MISSOURI.—Newspaper botany is often amusing, but occasionally articles appear that would do credit to high-class publications. These reflections occur from a communication in *Kansas City Star* of April 23rd, from the pen of Cameron Mann, on the Dog-tooth Violet of that region, *Erythronium mesachorium*, which until recently was regarded the same as the more eastern *Erythronium Americanum*, the yellow Dog-tooth Violet.

Mr. Mann says it is the herald of spring in that region. He introduces it to the reader in this pleasant way:—

"The first flower, in the sense that most people use the word, is one, whose grace and charm no one can miss. It does not require a scientific zeal to be interested in, nor a magnifying glass to delight in, that lovely plant, so unfortunately named "dog-tooth violet." Its bell-like blossom, whose petals finally recurve into a sort of rosette, white, with a faint azure or sometimes pinkish tinge; its large golden anthers, its elegant shining leaf of green, mottled with dark purple after the fashion of some eggs, all conspire to make a plant which cannot be seen without joy. As I have said, it is our first satisfactory flower. In ordinary years it may be looked for at least as soon as the first week of March. This year it was belated. I incline to think that absolutely its first appearance was on a shaly bank by the railroad track near Dodson, and that April 10th was the day whose sunshine unclasped the fastened bud of the earliest flower in Jackson County to greet the present spring."

He apologizes that his description is not in ordinary herbarium language, and offers the following excuse:—

"Still, the scientific names of plants are of small account. They are merely conveniences, figures or labels. The poor plants in an herbarium might be numbered like convicts in a prison."

To some extent, the remarks are sound. While some make herbariums for the proper purpose of studying plants, themselves, closely in the end, many act for little more reason than if they were collecting buttons.

He winds up the entertaining chapter by remarking on the kinds to follow the "Midland March-lily" as he terms the *Erythronium*.

"Since these first blossoms opened, things have come on apace. Thousands on thousands of their brothers and sisters are to be found in effulgence now, and groups of other

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Yes, the procession has begun, with soft flute notes from the band. Soon we shall hear the blare of trumpets and the roll of drums."

CYPRIPEDIUM SPECTABILE.—Venus' slippers or *Cypripedium* comprise one of our most interesting tribes of wild flowers, and are eagerly sought for by the lovers of the curious as by the enthusiastic botanist. The one figured herewith, reproduced from a photograph kindly furnished by a reader, *Cypripedium spectabile*, is one of the showiest of the North American species, and is found in a wide territory in the northeast portion of the North American continent. The slipper-like lip is especially attractive, being very large and prominent. Near populous districts, it is becoming rare, on account of its being torn out by so many admirers. It is a good illustration that beauty is often a dangerous possession.

BLUE-EYED GRASS—(*Sisyrinchium Bermudiana.*)—Seeing large patches of this very attractive little plant growing wild, last year, I was very much impressed with its beauty, so early in January, I made a journey to its native habitat and transferred some to the garden, planted as a double row bordering a large rose bed. It has well repaid me for the trouble. Even before it flowered, its little tufts of grass-like foliage were very neat, and, for the past month, from about nine in the morning until three in the evening, it is one mass of its exceedingly pretty little flowers of a very pleasing shade of blue, and it gives promise of continuing for some time to come; but it has one drawback, it closes so early in the evening; and, on cool, cloudy days, it doesn't open at all. The flowers must also be enjoyed upon the plant, as, soon after being plucked they close up, even if placed in water, never to open again. GEORGE THOMAS.

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Mr. Thomas does well to call attention to this very pretty member of the Iris family. Its habit of opening and closing at various periods of the day, and under varying conditions, gives it an additional interest in the eyes of those who love to note how plants behave.

Another interesting member of the family is *Sisyrinchium grandiflorum*, a rose-colored flower, discovered by Douglas on the northwest coast a half century ago, but only recently brought into cultivation.

SPRING FLOWERS.—Every locality has its own floral harbinger of spring. In the far South the Carolina Jasmine is believed to be the first born. A friend who was at Green Cove Springs, in Florida, at the latter end of the winter season, states that the earliest flower there is *Bartonia verna*. It is fully a week ahead of the Jasmine there.

CYPRIPEDIUM SPECTABILE--FLOWERS PURPLE.

sweet flowers, growing in Florida and in the warmer parts of California, is also found wild and cultivated over most of the world's sub-tropical area,—though, strange to say, its native home has never been discovered.

It has often been remarked that, though fragrance—and, indeed, odor in all its forms—is given to flowers to attract insects; in most families, but a few species are odoriferous,—to human senses, at any rate. *Acacia* is a remarkable example. Though some five hundred species are recognized by botanists, scarcely a dozen can lay claim to being sweet scented.

Laebek is the common name in Arabia,—and, as Lebbek, was adopted by Willdenow as the specific name.

WHY THE ARBUTUS AWAKES.—April 8, 1900, was bright, clear and windy. Arbutus was noted in bloom, the first for the season. I had a thermometer with me in the woods, and took some temperatures. The instrument, resting on a mat of Arbutus, under partial shade, registered 77°; at the foot of a tree, in partial shade, 76°; at the foot of another tree, but on the north side, fully exposed to the wind, 64° when the wind was blowing hard, and 65° to 66° when the wind temporarily ceased to blow. Elsewhere in a sheltered place, among the fallen leaves, in full, bright sunshine, I obtained a reading of 114°!

At points about six feet above the ground, in sunlight, I found the temperatures to be 68° and 69°; and on the north or shaded side of an oak tree, six feet from the ground, 64°.

Comparing these several readings, it will be seen that the day's temperature was about 64°, and that this temperature was carried by the wind in one case to the surface of the ground; but that in all other cases the soil was covered by a heat blanket, and that in one peculiarly favored spot a tropical heat was present.

The Arbutus buds, dormant during the winter, quickly respond in the earliest spring to the influence of the sun. It is not strange that a warmth of 114° should cause the flowers to open quickly. S. EDWARD PASCHALL.

Newfield, N. J.

EARLY SPRING FLOWERS IN NORTHWESTERN MISSOURI.—Newspaper botany is often amusing, but occasionally articles appear that would do credit to high-class publications. These reflections occur from a communication in *Kansas City Star* of April 23rd, from the pen of Cameron Mann, on the Dog-tooth Violet of that region, *Erythronium mesachorium*, which until recently was regarded the same as the more eastern *Erythronium Americanum*, the yellow Dog-tooth Violet.

Mr. Mann says it is the herald of spring in that region. He introduces it to the reader in this pleasant way:—

"The first flower, in the sense that most people use the word, is one, whose grace and charm no one can miss. It does not require a scientific zeal to be interested in, nor a magnifying glass to delight in, that lovely plant, so unfortunately named "dog-tooth violet." Its bell-like blossom, whose petals finally recurve into a sort of rosette, white, with a faint azure or sometimes pinkish tinge; its large golden anthers, its elegant shining leaf of green, mottled with dark purple after the fashion of some eggs, all conspire to make a plant which cannot be seen without joy. As I have said, it is our first satisfactory flower. In ordinary years it may be looked for at least as soon as the first week of March. This year it was belated. I incline to think that absolutely its first appearance was on a shaly bank by the railroad track near Dodson, and that April 10th was the day whose sunshine unclasped the fastened bud of the earliest flower in Jackson County to greet the present spring."

He apologizes that his description is not in ordinary herbarium language, and offers the following excuse:—

"Still, the scientific names of plants are of small account. They are merely conveniences, figures or labels. The poor plants in an herbarium might be numbered like convicts in a prison."

To some extent, the remarks are sound. While some make herbariums for the proper purpose of studying plants, themselves, closely in the end, many act for little more reason than if they were collecting buttons.

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INTENTIONAL SECOND EXPOSURE

GENERAL GARDENING.

MORNING IN SCOTLAND.

At noon the black-cock trims his jetty wing,
'Tis morning prompts the linnets blithest lay,
All nature's children feel the matin spring
Of life reviving, with reviving day.

SIR WALTER SCOTT.

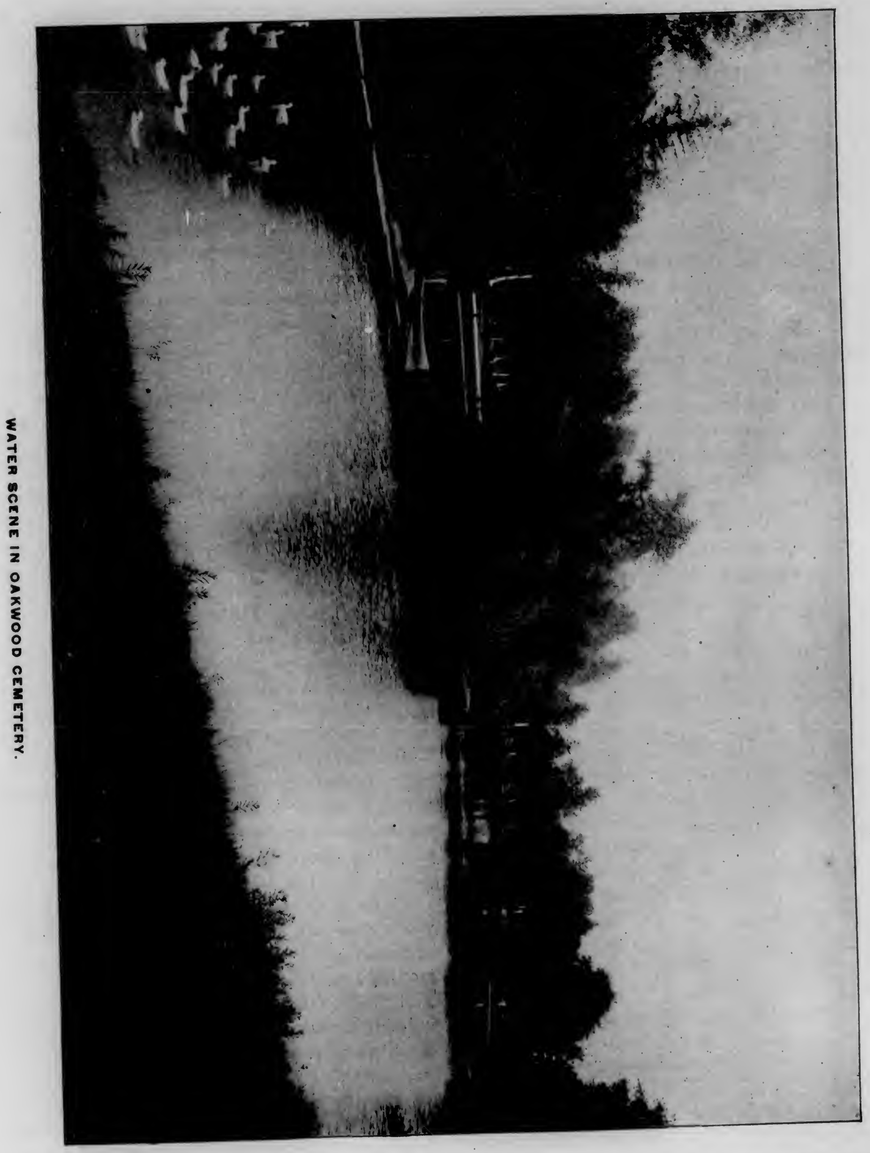
CHILDRENS' PLAY-GROUNDS. — Mr. G. N. Carruthers, of Springdale Farm, Oberlin, Ohio, thus pleasantly refers to a recent paragraph in MEEHANS' MONTHLY.—"As to parks and children's play-grounds: we grand-parents have one of the finest little parks within many miles around, for our numerous grand-children and many others whose parents will accompany them, including extensive lawn, water garden, lily ponds, windmill and water works."

PRACTICAL FORESTRY.—One of the arguments against forest planting is, that one has to wait so long for returns. MEEHANS' MONTHLY has, however, always contended that companies could be formed and land planted, the stock of which company would be of increased market value from year to year as the trees reached a commercial age. The value of a plantation of this kind has been well shown by the sale of a ranch in California. Part of the property was unplanted; this brought $50 an acre. Sixteen acres was in Alfalfa, the lucerne of other regions; this brought $200 an acre. A plot of 110 acres in hardshell walnuts sold for $350 an acre,—and eighty-and-a-half acres of softshell walnuts for $400 an acre. There is little doubt that forest planting, intelligently pursued, could be made profitable,—forest fires being the only uncertain element in the operation.

INJURY FROM THE RED SPIDER.—The Red Spider flourishes nearly as well in the open air, in many parts of this country, as it does in greenhouses. It is an especial lover of the spruce family. The past season they were so abundant, in many parts, that when noticed the trees had the appearance of having been scorched by fire. This insect can be kept very easily in check by spraying with kerosene emulsion, and if they can be kept clear from young trees, they are seldom troublesome to larger ones. When suffered to remain undisturbed from year to year, they increase rapidly, and this seems to be the trouble now. The fact is, that spraying with kerosene emulsion has got to be a part of garden work to be as regularly attended to as hoeing or pruning. Every garden should have its emulsion sprayer, and the trees should be carefully watched for the appearance of insects just as the regular garden crop is watched for the appearance of weeds. It is very little trouble to spray hundreds of trees in a short time with a good sprayer; and, generally speaking, when the insect is kept down in the younger trees it is not troublesome afterwards.

OAKWOOD CEMETERY, CHICAGO.—It is a remarkable fact, that sentiment has a greater influence on human conduct than logic or reason in any form. In every relation of life, this proves to be the case. Cemetery superintendents tell us that, in selecting a lot for a grave or the grave of the family, the desire is strong to secure a pretty site, where there is a beautiful view, or some especially attractive point to be gained in the selection. Indeed, it was this strong sentiment that led to the popular cemetery over the old-fashioned, dull and dreary church-yard. There are few who have no thought as to what is to become of their remains after death. If the great Egyptian King, Rameses, could have known that, thousands of years after his death, his dried and shrunken body would be held up as the leading feature in a six-penny show to attract the public gaze, it is doubtful whether he would not have much preferred to lie in one of our beautiful cemeteries, had there been any in those days, than to have been months in preparation for his grand mummy-case. With this is presented a

beautiful view in Oakwood Cemetery, Chicago. The owners, no doubt, could have had many more lots to sell had the water-covered spot been converted to dry ground. But the sentiment of beauty, to which we have referred, rules that many would prefer to locate near it than to have no thought further than the cold, cold ground.



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THE BEST DECORATIVE FERNS. — Where native ferns are sought for temporary, in-door decorations, there are some which must be avoided on account of the delicate nature of their leaves. Naturally, the evergreen kinds will stand handling the best. The Christmas Fern, *Aspidium acrostichoides* and *Aspidium marginale*, are the most popular. *Onoclea sensibilis* has a broad, tempting frond; but it wont last long after cutting. Nor will the Cinnamon Fern, though it has a fairly stout appearance, and nice long fronds.

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Orchids are so desirable when cut, and it being impossible to cut any stem with some of them, cattleyas particularly, that wherever there is an arrangement of them they are used in baskets or some low arrangement, and nothing accompanies them better than maiden-hair fern.

Instead of banks of palms, except when occasion demands such, the plant decorations are made by standing singly in every available spot a perfect specimen of palm or dracaena or croton. No such thing as a flower pot, however clean, should be exposed. There should be handsome jars in which the single specimens should stand. And in the groups, if the pots are not hidden by the smaller plants, then small plants of the Boston Fern, or better still, *Asparagus Sprengeri*, must finish the bottom end of the bank.

Nothing embellishes a flower like its own foliage. Roses should have nothing more, nor lily-of-the-valley, tulips or any bulbous plants or chrysanthemums. If the chrysanthemum foliage is not good, cut some that is. Anything else would be ridiculous. But carnations are weak in foliage, and sprays of *Asparagus Sprengeri* will go well with them.

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RHODODENDRON MAXIMUM.—An object of great beauty at present, coming into bloom, is the native *Rhododendron maximum*, our hardy kinds. A specimen of largest size, about forty years old, in the garden of Mr. W. Wander, on Forest Street, attracts universal admiration. Though the street is noted for fine residences, all clustered close together there as of such celebrities as Mark Twain, the late Mrs. Stowe, Charles D. Warner, Dr. R. Burton and the many others of very rich people, none seem to have this peerless white flower of our native woodlands, though it is by no means a common plant, found only in exceptionally favored situations.

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May electricity bring closer together also the minds, as it does the people at large, to solve the problem of a sound basis of education.

Hartford, Conn. MRS. WILHELMINE SELIGER.

SPIRÆA VAN HOUTTEI.

SPIRÆA VAN HOUTTEI.—Our gardens would miss the numerous species and varieties of *Spiræa* that flower in early spring, for, though mostly white, the habits differ so greatly, that they give great variety. One of the best known is the Bridal Wreath Spiræa, *Spiræa Reevesiana* of Lindley, though it was found subsequently to be identical with *Spiræa Cantonensis*, long ago described by Lourier. Recently, a beautiful variation of this species, raised by M. Zabel, of the Royal Gardens at Münden, in Hanover, and named by him in honor of the famous Belgian Van Houtte, *Spiræa Vanhouttei* has been introduced into our gardens, and promises to be popular. As the illustration shows, it has a pendulous habit, as against the stiff form of the parent *Reevesiana*. — Indeed, it is the habit chiefly that renders the variety so specially attractive. As the Van Houtte Bridal-Wreath, it will be extensively planted.

PARK MONUMENTS.—The enclosed clipping is from the *Buffalo Enquirer*, April 3, 1900, and while the strictures on your beautiful Fairmount Park may be undeserved, yet there may-be a substratum of truth in them, and afford food for reflection. The Buffalo parks, here alluded to, are beautiful and are the work of the late Wm. McMillan, an enthusiast of the natural style of landscape gardening.

Statuary and the geometric style of landscape gardening, have their appropriate uses in city lots and in proximity to buildings where a striving after natural effect would be equally incongruous.

Formal flower beds and geometric landscape gardening have their proper place in public squares and near dwellings, where an imitation of the irregular beauties of nature is out of question.

There is room for both styles. They need not and should not conflict.

Buffalo, N. Y. WM. FITZWILLIAM.

The clipping from the *Buffalo Inquirer* remarks, with some justice:—"Fairmount Park, at Philadelphia, has been spoiled by the statues which have been put in it. In a quarter of a mile drive one can see animal fights, Greek heroes, German musicians and American statesmen. Philadelphia is a warning to be observed by Buffalo before it is too late."

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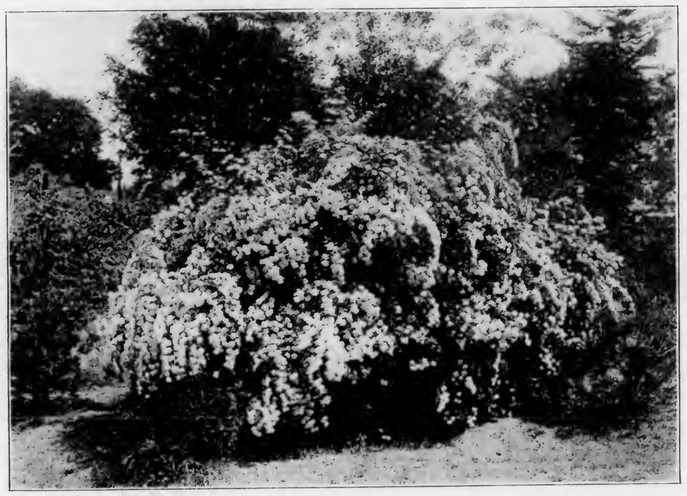

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PARK MONUMENTS.—The enclosed clipping is from the *Buffalo Enquirer*, April 3, 1900, and while the strictures on your beautiful Fairmount Park may be undeserved, yet there may-be a substratum of truth in them, and afford food for reflection. The Buffalo parks, here alluded to, are beautiful and are the work of the late Wm. McMillan, an enthusiast of the natural style of landscape gardening.

Statuary and the geometric style of landscape gardening, have their appropriate uses in city lots and in proximity to buildings where a striving after natural effect would be equally incongruous.

Formal flower beds and geometric landscape gardening have their proper place in public squares and near dwellings, where an imitation of the irregular beauties of nature is out of question.

There is room for both styles. They need not and should not conflict.

Buffalo, N. Y. WM. FITZWILLIAM.

The clipping from the *Buffalo Inquirer* remarks, with some justice:—"Fairmount Park, at Philadelphia, has been spoiled by the statues which have been put in it. In a quarter of a mile drive one can see animal fights, Greek heroes, German musicians and American statesmen. Philadelphia is a warning to be observed by Buffalo before it is too late."

INTENTIONAL SECOND EXPOSURE

THE HARDY FLOWER GARDEN.

HARDY WATER LILIES AND BOG PLANTS.—The list of good Hardy Water Lilies is not large, though improvers in that line are occasionally producing new varieties, all of which are welcome. The main ones in use are *Nelumbium luteum*, *Nelumbium speciosum*, *Nymphaea alba candidissima*, *Nymphaea odorata*, *Nymphaea odorata rosea* and *Nymphaea flava*. A pond and its surroundings may be made artificial, or with taste it may be transformed into a beautiful and attractive spot,—a haunt where Nature seems to have full sway, yet in neatness and harmony. The following plants may be used to advantage in low moist situations :—*Arundo donax*, Eulalias, Laurel-leaved willow kept low and bushy, *Sambucus Canadensis*, *Typha latifolia*, *Acorus Calamus* and *variegata*, *Japanese* Iris, *Iris Pseudacorus*, *Caltha palustris*, and many similar swamp-loving plants might be mentioned. There are but few men at the present time well versed in the art of producing fine effects on and around the water, and the field is open for a very interesting study. Where tender acquatics can be cared for, the opportunities are largely increased, as there are many beautiful plants and flowers that can be utilized.

THE RED-FLOWERED CURRANTS.—The *Ribes rubrum*, or red-flowered currant of the Pacific coast, is a beautiful garden ornament in localities where the summers are not hot for a continuous period. Its near neighbor, *Ribes viscosissima*, is also a beautiful small shrub, but with the leaves and fruit covered with a viscous secretion, as its specific name implies. Presumably this is the "Rose Currant," recently introduced by Mr. S. L. Watkins, of Lotus, California, as a desirable fruit. He says of it :—"This variety of currant when ripe is very oily—that is the berries are covered with a substance resembling oil or grease ; but the oil does not in any way injure the flavor of the fruit which is excellent. The Rose Currant is a beautiful red type of the black currant ; flavor or aroma is similar to the black currant."

LONG-SPRAY FLOWERING SHRUBS FOR CUTTING.—There are many shrubs and herbaceous plants that will furnish flowers suitable for cut-flower purposes ; but those which will furnish long sprays of flowers, suitable for large decorations, are not plentiful. Among spring and early summer flowers the following are most suitable :—Flowering Peach and Almonds, *Forsythia*, *Halesia*, *Neviusia*, *Spiræa prunifolia*, Japanese Snowball, and *Weigela*. The following bloom in mid-summer and fall. *Desmodium*, *Boltonia*, *Helianthus Maximiliani* and *Rudbeckia* "Golden Glow." The flowers of the last named are not exactly produced in sprays ; but the long stems, well furnished with flowers on shorter stems, fill the requirements. A difficulty with most of these flowers is that they will not last long unless in water, and except, possibly, in the case of the *Helianthus*, which is well-adapted in every way. The weigelas have particularly long stems of flowers, and always look well.

FRUITS AND VEGETABLES.

NATIVE RASPBERRY CULTURE.—A Michigan fruit-grower, writing to the *National Fruit Grower*, gives some excellent advice concerning the culture of raspberries, which will largely benefit the growers of other States. After dwelling at length on the ill-effects from improper pruning, he says :—

"Raspberries need pruning, but less than half as much as was formerly recommended. The plants must grow wood and leaves, and to check them severely with the expectation of fostering fruit-bearing is too much like cutting off a man's arms to give his brain a better opportunity. The plan might work, but it is of doubtful utility. Nature demands something nearer equality.

For garden culture we have found the same methods as are used for field culture are most satisfactory. We do not believe in the practice so often followed of setting a row of bushes along the fence. The plants are then where they are most certain to be neglected. Insects and disease easily get in and are hard to manage in such cases. The ground cannot be cultivated as it should be, and the result is a struggle between the berries on the one side and grass and dry weather on the other, with the odds against the fruit. Rows of clean, well-kept canes are an ornament to any garden, but neglected bushes along the fence soon become a nuisance.

Experience has taught us that raspberries should not be crowded. On ordinary soil we would not set closer than four feet in the row and have the rows eight feet apart. This will seem to the novice like a long distance apart and it will take up considerable room. He may set them closer, perhaps three feet by six, but the new varieties now being planted are so vigorous that it is doubtful if such close planting is to be recommended, even in a garden. This would make quite a difference in the number of hills, but the returns for the space occupied would probably be about as large.

In regard to cutting back, no fixed rule should be given. Much depends upon the habits of growth of the variety. Strong, vigorous canes, like the Gregg and Shaffer may well be three or four feet long. They are stiff enough to stand up, and it is a great convenience to the picker to have the fruit where it may be reached without much bending over. This is a point that should receive more attention than it does. A picker's back should be worth something. But there are other varieties which never get far above the earth. Some of these we find make the best canes when cut back to a foot and a half or two feet high. If allowed to get higher they break down. The Nemaha is an example, if pruned low they stand up much better. There are other varieties which come in midway between these extremes and they should be treated accordingly. At least two inches of the tip should be cut off and more than this is better. It shouid also be kept in mind that a cane will increase some in length after being clipped. We allow about four inches for this.

The laterals we do not interfere with till spring, unless they get so long as to be in the way. Then leave them from one to two feet long, depending upon the ability of the cane to support them. About the only guide is the knowledge obtained from experience and observation, which is usually easy to get in the raspberries.

The old wood may be cut out during the last of August or at any later time in the fall. Formerly we were told to cut it out as soon as picked, but as the new growth draws some nourishment from these old canes it is better to leave them until they begin to dry. Some growers recommend leaving the dead canes till spring, so that they will assist in holding the snow about the hill, but we have not found them of much benefit in this way. The garden certainly looks better if all such rubbish is gathered and burned in the fall.

One of the common mistakes is to leave more canes to a hill than there should be. Four or five stalks have done better for us than more. The fruit is larger and better and there is as much of it as when there are many canes.

The varieties are numerous and continually being added to, but there are a few which have been found to succeed almost anywhere in lower Michigan and adjoining territory.

Among the black caps are the Palmer, Conrath, Kansas, also the Gregg on anything except moist soil. The Cumberland promises well and may in a few years be the leading berry.

The Cuthbert is still in the lead among the reds, though the Loudon is growing in favor. The Miller is recommended by some, but in some localities it lacks in flavor.

Among the purples the Shaffer is being superseded by the Columbian, which is certainly an excellent berry in every respect. The much advertised, ever-bearing Gladstone is found wanting. It yields berries from summer till winter, but not many at a time.

There are many excellent varieties which are satisfactory when grown under the proper conditions. It is well worth the trouble to look them up if one is setting berries for home use. But we believe that those given will prove satisfactory in as great a variety of locations as any. Some of the European varieties are occasionally set, but they are too tender to do well without protection. The quality, however, is superior to the American sorts."

SALT FOR ASPARAGUS.—In sandy or comparatively dry soil, salt is an excellent article to apply to asparagus beds. It will not, however, take the place of strong manure. Its chief office seems to be to encourage a plentiful supply of moisture. Hence, on soils already retentive, salt is of little use,—and, indeed, may, at times, be injurious.

LOW-HEADED APPLE TREES.—The *American Fruit and Vegetable Journal* says :—"The experienced fruit-growers of the Mississippi Valley are coming more and more to see the value of low heads. The following excellent advan-

tages for low heads for apple trees, as given by Jacob Faith, in the *Western Fruit Grower*, are first-class and right to the point: 'The crop can be picked at one-half cost; fruit will not damage so much when it drops; trees will come into bearing one to two years younger; will stand more erect; will endure more storm and sleet, sun scale and bark burst; will live longer and bear more fruit.'"

STICKS FOR PEAS AND OTHER CLIMBERS.—It is said that peas will make double the growth, and largely increase the product, when favored with sticks or twiggy branches for them to run over. And this seems true of all climbing plants. Who has not noted how happy a branch of a grape vine seems, when it can get a chance to run over a bush? Philosophers give, as the reason, that a climbing plant is always twisting and twining to find something to cling to,—and thus wastes energy that should be applied to growth.

TOMATO CULTURE.—Frequently tomato plants are severely thinned of leaves and branches, in order, it is said, to let in the sun to ripen the fruit. But ripening is a vital process. Good, healthy leaves and foliage are essential to this, and the fruit will ripen better under the shade of such foliage than when exposed to the sun without the leaves. Where the branches are so numerous, it is of advantage to thin out weaker ones to give more strength to the rest.

BEST LOCALITIES FOR RAISING VEGETABLES, ETC.—It is very interesting to read the statement of Messrs. W. Atlee Burpee & Co., Seedsmen of Philadelphia, showing what they consider the best localities for seed production. While "Fordhook Farm," Doylestown, Pa., produces many of the seeds used, both vegetable and flower, "all parts of the United States as well as many foreign countries are drawn upon to furnish special kinds of seed. which can be brought to a greater degree of perfection in more favored localities.

For instance, special growers furnish large quantities of peas and beans from the upper part of New York and adjoining regions of Canada; from the dark, damp Florida soil come watermelon seeds; musk melons and squashes do best in New Jersey and Nebraska; cucumbers in New York; tomatoes come to their fullest degree of excellence in Pennsylvania and Ohio; the bulk of the best radish seed comes from France, while many flower seeds and some of the larger varieties of onions come from Italy. The greater part of the cabbage seed used in this country comes from Bucks County, Pennsylvania, and from Long Island, while the best onions are produced in Connecticut and California. We go all the way to Denmark for cauliflower seed, and to California for the best lettuce seed. Even such distant parts of the earth as Russia and China and Japan, are drawn upon for rare varieties of both flowers and vegetables."

A visit to the extensive trial grounds at "Fordhook," would interest anyone. Visitors are received on Wednesdays. In addition to the things horticultural, there are Thoroughbred Fancy Poultry and Scotch Collie dogs.

THE POTATO STALK-WEEVIL.—The greatest enemy of the potato grower to-day is the stalk-weevil. Since copper solutions have aided us so materially in our fight with mildews and molds, and Paris Green has been so great a friend to us against the Colorado Beetle, we should have little trouble but for the stalk-borer. It would not be too much to say that it has probably lessened the potato crop of America one-half.

The misfortune is that its work is unknown to the average cultivator. He sees his potato stalks wilt under the first warm sun, and rests satisfied with the thought that the "hot sun was too much for them." It was too much, simply because the weevil had bored the stems hollow.

The beetle is closely related to the Plum-weevil on Curculio; but it has scarcely taken on the beetle form before it commences to lay its eggs in the stem at the surface of the ground. The egg soon hatches, and bores its way through the centre of the stem. The egg-laying commences about the end of April in this latitude,—and the boring is about complete, and the stem ready to die about the middle of June. Some have thought that they preserve their potatoes by placing a small portion of Paris Green around the stems as soon as they appear above ground; but as the beetle at this point and in this stage simply inserts its ovipositor in the stem, it is not clear that good results can follow. If it were to feed on the leaves to any great extent, as the Colorado Beetle and its larvæ do, it would certainly be useful.

The larvæ or pupæ live over winter in the dry stems; pulling up and burning these after they have fulfilled their mission of producing a crop of small potatoes, would therefore destroy great numbers.

The misfortune is that the creatures pay attention to the Jimson weed, and other members of the Solanum family; so that after the cultivator has kept his own land clear of the pests, he is liable to an influx of a new breed from the grounds of less careful neighbors.

JAPANESE PLUMS.—The comparatively new race, known as Japanese Plums, is receiving considerable attention. The early author on the Botany of Japan, Thunberg considered it as but a garden race of the ordinary plum of our gardens, *Prunus domestica*, — but after all the real origin of the garden plum has not been ascertained beyond all controversy. More recent authors, however, consider the Japan a distinct species, and it goes in the botanies as *Prunus Japonica*. Be that as it may, the race makes a nice addition to our garden fruits, though it would be a risk to say they were superior to a well-ripened specimen from a healthy tree of the old-fashioned garden kind.

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Some merit has been claimed for the new race on account of its freedom from injury from that destructive enemy, the Plum Curculio. It is said that even Curculio marks have been found, without rot resulting. But it must be remembered that it is not the mark that causes the rot, but the gall that is excreted when the egg is deposited. There is nothing in the plum, itself, to prevent the egg from developing to a perfect insect. But insects, in common with all animal nature, are governed, to a great extent, by experience. They have learned that the peach, apricot, cherry, and other fruits besides the ordinary plum, are faithful and secure depositaries for their young. The mark on the Japan plum, without the subsequent egg deposit, might reasonably be attributed to the uncertainty as to its being the proper place. All this experience will correct.

However, the race is popular at present, and improvers are at work on them. A recent Bulletin of the Horticultural Department of Cornell University, figures a number of varieties. One of these is the Wickson, as much to show the general character of the whole race, as to illustrate the particular variety. As to that, however, the Bulletin regards it as promising to be a very prolific bearer.

GRAPE WORMS.—A correspondent finds worms in grapes. He never heard of such a thing, and inquires "What is to be done about it?"

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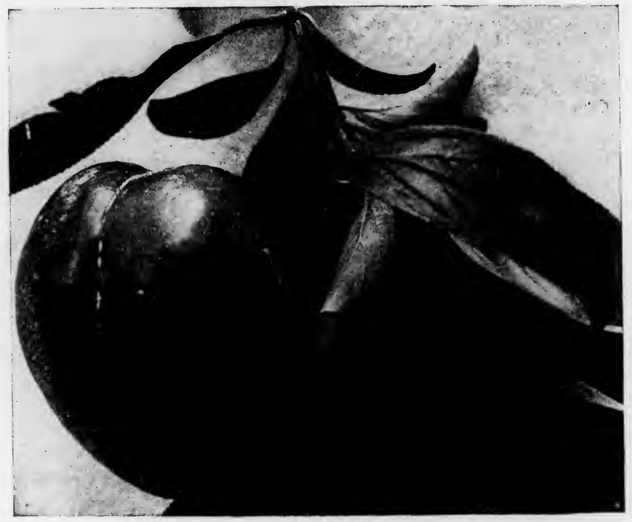

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of peas. This not only keeps insects from troubling, but also the spores of mildew and mold,—and the berries ripen just as well in the shade the bags give."

BURYING THE TRUNKS OR STEMS OF FRUIT TREES.—Ill-informed cultivators have but a faint idea of the reasons why trees should not be deeply planted. It is not because of any injury to the trunks, but because the feeding roots need the oxygen of the atmosphere in the preparation of the food, just as much as the leaves do. So far as the trunk is concerned, burying under the earth is a benefit rather than an injury. If it were possible to have the stems or trunks several feet beneath the surface, and the roots only a few inches, the vigor of the tree would be enhanced thereby. But, though this is impossible, earth on the surface can be heaped around the trunk to advantage, as long as we do not bury too great a root-feeding surface. This was well exemplified, nearly half a century ago, by a peach grower, near Cincinnati, named Bolmar. He had earth by the cart-load heaped around his peach trees. His orchard had the appearance of being covered by miniature hay stacks. The growth and general health of the trees were so remarkable, that the owner was moved to secure a patent for the idea. The patent would not hold. No one could be restrained against earthing up a fruit tree any more than earthing up a row of celery. But it was a grand object lesson,—and he deserved some recompense. There can be no doubt, but that it would be to the advantage of orchardists, generally, to have mounds of earth around the base of their fruit trees, and it is surprising that such good practice is so generally ignored.

PRUNUS AMERICANA AS A STOCK AND FOR FRUIT.—Prof. Greene, of the Minn. State Experiment Station, finds that the *Prunus Americana* is a more satisfactory stock for plums than either Myrobalan or Mariana in that State, where extreme hardiness is essential. It is not inclined to sucker freely, and unites well with the scions of native plums. While a vigorous grower, it is liable to be outgrown by European varieties worked on it.

As a fruit, the varieties produced from the *Americana* meet with general favor among fruit-growers, many of them preferring them to all other types, on account of their hardiness and productiveness, though averaging small size.

THE GRAPE-VINE ROOT-APHIS.—The root-aphis, or, as the learned love to call it until the next new name, *Phylloxera vastatrix*, like all breathing animals, can be killed by drowning. Malcolm Dunn, lately deceased, the famous gardener at the no less famous gardens of the Duke of Buccleugh in Scotland, so arranged the vine borders of his grape houses, that, when the vines were not growing and water at the roots would not hurt them, he could submerge the borders for a considerable time. He had no trouble then with the Aphis. He was a remarkably practical thinker and his death is regarded as a great loss to British gardening.

THE STRAWBERRY-BLACKBERRY.—A correspondent seeks information as to the Strawberry-Blackberry. Judging from the descriptions in California papers, it is an improved variety of the wild Blackberry of the Pacific coast, *Rubus ursinus*, and has been called the "Strawberry" as being as good a name as any other to distinguish it by.

SEEDLESS ORANGES.—A correspondent says:—"Bradstreets (of New York) has, in to-day's issue, April 7th, at pages 222, etc., a valuable article describing the 'Seedless Orange,'—the 'Tibbetts Orange,' now largely grown in California for our eastern markets. It appears worthy of attention and we should be glad to have your opinion of it."

Apples, pears, grapes and other fruits, produce individuals at times that are coreless or seedless. As a general rule in these cases, the resultant fruit is smaller than in normal condition. The value of these abnormal forms depend on the uses to which they may be put. No special value has resulted from the seedless apples or pears. In the grape, the seedless raisins and currants fill a useful place in culinary art. Possibly the "Navel" is meant, which is a seedless orange.

It is not generally known that there are distinct varieties of the Navel orange. As it does not produce seed, it seems difficult,—unless the ordinary orange seedlings take occasionally to produce other "Navels." The first one came in that way.

BIOGRAPHY AND LITERATURE.

"Oh or a booke and a shadie nook,
Eyther in doore or out;
With the grene leaves whispering overhead,
Or the streete cryes all about.

Where I maie reade all at my ease,
Both of the newe and old;
For a jollie goode booke whereon to looke,
Is better to me than golde."

OLD ENGLISH SONG.

CHARLES EASTWICK SMITH.—In the May issue of MEEHANS' MONTHLY, is an account of the presentation, to the Academy of Natural Sciences of Philadelphia, of an oil painting of Linnæus, by Mr. Chas. E. Smith. Since that time this excellent botanist has passed away. His death occurred in Philadelphia on April 15th, in his eightieth year. Few have greater claims to be regarded as a botanist of the highest order, though, as an amateur he cultivated the science for the pleasure it afforded him. He had the intimate friendship of most of the leading botanists in many parts of the world. Dr. Englemann named *Juncus Smithii*, and Dr. Gray *Scirpus Smithii*, in his honor.

He leaves an estate estimated at about half a million of dollars, of which one-sixth, together with his herbarium and botanical library is willed to the Academy of Natural Sciences of Philadelphia.

NATURE'S GARDEN.—By Nettie Blanchan, New York, published by Doubleday, Page & Co. Botany, in its advanced stages, does not make botanists. Of the thousands annually taught botany in our higher schools, colleges, and universities, few care for the study after their school days are ended. In the old bookstores, near these large institutions, text books on botany are almost a drug, their owners glad to get rid of them before starting for home.

Few would want to part with "Nature's Garden" in this summary way. It is given as an aid to knowledge of our wild flowers and their insect visitors, with many colored plates and other illustrations. It is a large book of some 400 pages, and describes over 500 of our wild flowers. Young and old will read it with untiring pleasure,—and it will find a permanent and welcome place in all family and school libraries.

It may be remarked, in this place, that much that goes as science in the study of flowers is but the speculation of enthusiastic devotees or eminent scientific men. But these speculations, when a little wild, are usually swept away as sound knowledge progresses, and popular works may well be forgiven if science and speculation sometimes get a little mixed. In fact, speculations rather aid than obstruct the advance of science,—and should not be criticised when they occasionally obtrude in beautiful works like this.

BOTANICAL NAME OF RAGGED ROBIN.—A correspondent complains of confusion in regards to the botanical name of the familiar Ragged Robin, which he has known as *Centaurea Americana*. There is no rule for deciding the right of a plant to any particular name. Any one has a right to give any name of this kind to a plant. No doubt there are scores of plants called Ragged Robin. If priority has a claim, as it has in technical botany, we must go back to the time of Robin Hood—and his ragged rangers of Lincoln Green. In this way, Ragged Robin came to be associated with *Lychnis Flos-Cuculi*. England is a small territory, and a name once started gets through the community easier than it does with us. This *Lychnis* is the only Ragged Robin of the English people.

PRESIDENT KRUGER'S GARDENING.—A correspondent of the London *Gardeners' Chronicle*, describes the President of the South African Republic, Paul Kruger, as an enthusiastic lover of gardening. He has a fine collection of daffodils in which he takes great pride. It is a common experience to find him in his garden, trowel in hand. He has a grand collection of Phloxes. He is especially fond of his pot-plants.

GENERAL NOTES.

THE EXPERIMENTAL FARM AT OTTAWA.—It will be good news to those who know of the beautiful gardens and buildings of the Dominion at Ottawa, that it escaped serious injury from the recent disastrous fire around it. Under the direction of Prof. W. Saunders, a large force of hands were employed as watchers and several hundred incipient fires put out before they got a fair start in any case.

A MISPLACED LABEL.—People who mark trees by sticking the label in the ground at the base of the trunk, run the risk of the information they wish to convey, sometimes curiously miscarrying, as the following clipping from a Philadelphia newspaper seems to show. The writer is describing an April visit to the Botanic Garden of the University of Pennsylvania, and has evidently mistaken the scientific name of the Norway Maple for that of some spring flower in bloom about the tree's root :—"At the foot of a Norway Maple, and, indeed, in many other of the corners, and especially in the rocky fastnesses which range 'round, is an *Acer platanoides*. Its stems, laden with bright blue blossoms, look very attractive."

Acer platanoides, "laden with bright blue blossoms," would certainly be worth quite a trip to see. C. F. SAUNDERS.

Philadelphia.

The reporter evidently mistook the botanical name of the Maple, *Acer platanoides*, for the name of the pretty blue flowers (Grape Hyacinths?) in the midst of the plot.

BACTERIAL TROUBLES.—*Popular Science News*, tells us that popular opinions in regard to microbes are being driven to the verge of absurdity.

Quoting the "Medical and Science," it asserts that those who know the most about the theory of diseases have still many things to learn. It even goes so far as to assert, "that the simple precaution of protecting the water supply from contamination by human excreta may prove to be illusionary." Not only this, but the "hygienic precautions looking to the prevention of the contamination of water supplies which we have heretofore considered trustworthy, will now be found to be unreliable." It seems to intimate that the baccilli, of which we have heard so much, passed through individuals in hundreds of thousands of cases without doing the slightest injury, and it is only when there is a lowered resistive vitality in the individual that serious injury results. It is probable that the whole truth lies between both the extremes, and one class of scientific men assert that in all cases the presence of microbes is necessary to produce disease, while the other class insist that there must be either a tendency to disease and lowered vitality before injurious results are found. Certainly there seems evidence strongly in favor of both propositions. There are times when numbers of persons are swept off by epidemics when there is no reason to believe that there has been any lowering of their vital powers of resistance,—and yet the same strong facts can be induced from the opposite theory.

NEW VARIETIES OF FLORISTS' FLOWERS.—In our country, florists seldom have sympathy for even the best carnation for more than a few years. New and good carnations are always popular. In striking contrast is the practice with European carnation growers. The Souvenir de Malmaison, that has been popular for nearly half a century, is still the chief dependence of an English carnation grower.

MYROBALAN PLUM FOR HEDGES.—The Myrobalan Plum is getting into great demand, in England, for hedges,—or, as we say, live fences. The plant does not seem to have been tried in America. It would probably be found too good a breeding ground for the plum-borer, and, if so, the country has enough encouragement for this pestiferous insect already.

2

1

ERIGERON SPECIOSUS

ERIGERON SPECIOSUS.

SHOWY ERIGERON.

NATURAL ORDER, COMPOSITÆ.

ERIGERON SPECIOSUS. De Candolle.—Sparingly and loosely hirsute or with a few scattering hairs; stems mostly two feet high, very leafy to the top; leaves lanceolate, acute (three to eight lines wide), sparsely ciliate; lowest more or less spatulate; involucre hirsute-pubescent, or sometimes almost glabrous; rays half-inch to almost an inch long, violet. Gray's *Synoptical Flora of North America*. See also Brewer and Watson's *Geological Survey of California*.

Those familiar with the Flora of the Eastern United States, are well acquainted with the genus *Erigeron*, two of the species of which, *Erigeron strigosus* and *Erigeron Canadensis*, are so abundant in fields devoted to hay crops as to form the bulk of the material, in many cases, and present a perfect sea of white when in bloom. The former is known to farmers in Pennsylvania and other States as Daisy, and occasionally Fleabane, — and the latter as Horse-weed and Butterweed, the name Butterweed being probably derived from the disk, the color of which is more conspicuous than in the daisy. Though this will give some general idea of the genus, it gives a poor idea of the beauty of many members of the family. The species here illustrated, *Erigeron speciosus*, is perhaps the handsomest of the genus. In the early days of July, 1883, during a botanical excursion in the vicinity of Port Townsend, in the then Washington Territory, it seemed to the author the most impressively beautiful of all the wild flowers of that region. It had possession of large areas in open, grassy places; and the rich violet flowers, tempered by the pale yellow disk, were almost dazzling in effect. In this situation, massed together, they were not as rigid and stiff as one might infer from the drawing, but had more of a go-alone character, much as we may see in a red clover plant.

In Washington and Oregon, however, it is very commonly met with; but varying greatly in its general character in different localities. Nuttall collected it on the shores of the Columbia River; but his specimens have the leaves so long and narrow that they might almost be termed grass-like; while specimens from the line of the Clearwater River, gathered by the Rev. Mr. Spalding, are short and broad, like the figure in the "Botanical Register," the plant from Douglas' seed. The form herewith figured is intermediate between these two extremes. The picture was taken from specimens kindly supplied by Mr. Jackson Dawson, of the Arnold Aboretum; but the exact locality of the original is not known except that it was somewhere from Washington Territory.

A well established common name is often of value to those who study the history of plants. In this case, a number of species are known as fleabane, though, so far as known, they are not the bane of fleas or of other insects. This is the common name of species of *Conyza*, common in the Old World, and which are very useful as indicated by the name in question. In looking up the history of *Erigeron*, it will be found to have been originally classed with *Conyza*. So recently as the time of Ray, a European species, *Erigeron glutinosus*, was known as *Conyza montana*,—and our own *Erigeron Canadensis* is treated of, in the ante-binomial times, as *Conyza annua acris elatior linearæfoliis*. This species, therefore, would be the original fleabane among North American ones, should the rule of priority be extended to common names as they are to those botanical. Even the name *Erigeron*, itself, has an interest for philologists. It is the Greek representative of *Senecio*. This *senex* means an old man, and was applied by the ancients to the Groundsell, *Senecio vulgaris*, and suggested by the grey-haired heads of that plant when in fruit. The Greek *geron* stands for *senex*; and *er* the spring, is suggested by the spring flowering of the Groundsell,—literally, the old man in

COLOR PLATE

2

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COLOR PLATE
INTENTIONAL SECOND EXPOSURE

spring. Since this was pointed out by Dr. Asa Gray, the old form of the name, in the neuter gender, has been changed to the masculine. Our plant, formerly *Erigeron speciosum*, is now written *Erigeron speciosus*.

In the genus *Erigeron*, there are over one hundred good species. A large number are American. Dr. Asa Gray, in the work from which our description is taken, adopts sixty as the number for North America. In all large genera, botanists endeavor to find some strong, dividing lines to establish other genera, and attempts have been made to do this service in *Erigeron*. The plants we now have here at various times found themselves in some couple of dozen genera. Our plant was in the genus *Stenactis* established by C. G. Nees. In the original *Erigeron*, there is some difference between the pappus of the ray and those of the disk florets, and *Stenactis* was founded mainly on this difference. But it is found this line is too indefinite to be accepted. It is, however, to be found under the title of *Stenactis* in the botanical works of the earlier part of the present century. In Garden literature, our plant usually appears as *Stenactis speciosus*. Nuttall supposed his grassy-leaved plant, found near the Falls of the Columbia River, might be a new species, and left his specimen without a name; but Dr. Gray has written on Nuttall's label "only a narrow-leaved form of *Stenactis speciosus*." The leaves are three inches long, and not more than half an inch wide at the clasping base.

What is true of dividing the species is true of the genus itself. It is extremely difficult to say how the genus should be defined as distinct from its neighbors. It is one of those cases where nature presents us with a genus without the assistance of the expert botanist. A plant is decided to be an *Erigeron* by what the French call a *coup d'œil*. It can be seen to be an *Erigeron*, without knowing well the reason why. No one familiar with *Aster* would take an *Erigeron* to be of that genus. There is something distinctive in the general appearance,—especially in the very large number of ray florets, which are also very narrow and in several rows. The involucral scales, of the common receptacle, are also numerous and narrow, and they are more uniform in size and character than in *Aster*, where they are in varying degrees of size and form in the same flower-head. In botanical descriptions, attention is usually but little given to the characters of the florets. This is owing, in a great measure, to the necessity of describing from dried specimens. The student should take any occasion to examine fresh flowers with an ordinary pocket lens. Good distinguishing characters will often be found in the akenes, pappus, and the florets themselves.

In arranging a large family like *Erigeron* for classification, it is the part of genius to so arrange the species that continuous repetitions of terms can be avoided. In the character adopted, in this chapter, from Gray's *Synoptical flora*, one could not well decide that our plant was *Erigeron speciosus*, from the brief description given. The leading points are given in sections, sub-sections, and divisions. We have to go back to a subdivision, in which the collection, as described by Dr. Gray, would be "less Aster-like; lower rays more and narrow; involucre closer; pappus more or less double, but the exterior minute, setulose, or subulate-squamellate; stems chiefly erect, tufted, generally leafy to the summit, and bearing few or several heads, leaves entire." But still further back we find this has to be included in another sub-division of ones "comparatively tall and large, a foot or more high except in alpine or depauperate forms, leafy-stemmed, glabrous to soft-hirsute; leaves rather ample, entire or occasionally few-toothed; heads pretty large, with usually very numerous rays; montane or alpestrine." Still further, however, we must go back to another division in which the plants are "true perennials from root stocks or a caudex, neither stoloniferous-surculose nor flagelliferous; involucre from hispid or villous to glabrous, but not lanate, in the first species loose and spreading; all western or northern species." And all these again under one grand sub-division, named specifically *Euerigeron*, in which the rays are elongated and conspicuous, or in a few species uniformly wanting, in one or two occasionally wanting; no rayless female flowers between the proper ray or disk." It is by these careful sub-divisions that the student is enabled to work out his collections with nearly as much ease as in small genera.

EXPLANATION OF THE PLATE.—1. A nearly full-length specimen from Washington Territory. 2. A vertical section of a receptacle, with a single floret,—magnified.

WILD FLOWERS AND NATURE.

A SUMMER OUTING.

Pleasant it was, when woods were green,
And winds were soft and low,
To lie amid some sylvan scene,
Where, the long drooping boughs between,
Shadows dark and sunlight sheen
Alternate come and go;

Or where the denser grove receives
No sunlight from above,
But the dark foliage interweaves
In one unbroken roof of leaves,
Underneath whose sloping eaves
The shadows hardly move.

LONGFELLOW.

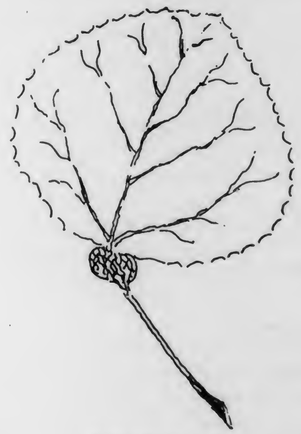
DOUBLE ORANGES.—With this mail I send you what to me is a curiosity. It may not be to you. To me it seems to be a little orange which was taken out of another orange, from the blow end, both apexes being one. If this is worthy of notice in your journal, I should be glad of the explanation. I wanted to cut it open, but, I thought if it might be new to you that you would like to see it whole.

Moscow, Vermont. TIMOTHY WHEELER.

The specimen sent was a little larger than a child's marble. It represents a class known as "navel oranges." There are a number of varieties, some with the secondary orange larger than this, some with smaller. As in other fruits, selections are made by the fruit improver, and these selections continued by grafting.

These wanderings from what may be termed the normal type, are not uncommon in the vegetable world. One, the most frequently seen, is one rose growing out of the centre of another. The explanation is, that a flower or fruit is but a branch that has been arrested in its growth; and that the petals of the flower and carpels of the fruit are what might have been leaves. In such cases as this of the orange, the arrestation of the branch has not been complete. It starts on again in a weak attempt to make another set of leaves,—or, as they really become, another depauperate flower and fruit.

POPLAR GALLS.—Mr. W. C. Egan, Highland Park, Illinois, says:—"While ruminating in the woods, to-day, I came across quite a thicket of seedling poplars, from five to seven feet high. A great number had a large percentage of their leaf stems encircled, at the base of the leaf, by worm-galls. At first, on account of the regularity of position, I imagined a new method of seed ball attachment, but upon cutting the ball open I found a small green worm. The singular feature to me is that I could not find any balls except at the base of the leaf."



POPLAR GALLS.

Few things in natural history afford more pleasure to the student of nature, than the wonderful judgment displayed by insects in their life economy. At one time, when man was thought to be exceptional in the animal kingdom in being gifted with judgment, the lower orders merely following blind instinct, little was thought of the remarkable adaptations to conditions everywhere seen about us. It is different, now, when knowledge has progressed. In the present instance, the judgment displayed by the little fly in depositing its eggs is remarkable. At the base of the leaf-blade, in the poplars, are glands excret-

ing a honeyed-secretion, very grateful to ants and other creatures having "a sweet tooth." This would also furnish excellent food for the larvæ of the insect. The fly has found this out, and, with unerring judgment, the egg is deposited in the gland, and the gall—the homestead of the "worm"—is furnished with pantry and dining-room, as well as a parlor for the young in which to enjoy themselves.

ERIGERON SPECIOSUS AT HOME.—Possibly the inspiring effect, noted in the main chapter, was aided by the view being from a knoll that afforded the opportunity of looking down on the masses of flowers below. It has long been cultivated in English gardens, where it is esteemed as a leading ornament, having been sent over, by the unfortunate Douglas, from California to the Royal Horticultural Society of London. It is on this account that it is accredited to California by Watson, though he remarks that it has not been found so far south as the line of that State since Douglas' time.

MEDICINAL VALUE OF THE HONEYSUCKLE AND MORNING GLORY.—Along one of the side streets of Philadelphia, near the Reading Terminal, the passer-by may be attracted to a modest and well-worn show-case filled with samples of various wares of an "Herb Doctor" that are calculated to cure about all the ills to which the human body may be subject. Judging by the labels attached to the various mixtures and by the cards soliciting their use, the "Doctor's" illiteracy is about as strong as his medicine, and will be certain to cure anyone too ill to laugh. One of his most prominent prescriptions is Honeysuckle and Morning-glory, which is held as a sure cure for asthma and colds generally.

DIATOMS.—These plants have a peculiar method of vegetative multiplication which is unlike anything found elsewhere among the algæ. The two halves of the "box," which are called valves, begin to separate slightly from each other, and as the contents divide into two parts, there is formed within two new halves, one fitting into the larger half of the original cell, and the other forming a new box with the smaller half of the parent plant. These then separate, and thus there are formed two diatoms of exactly the same construction as the mother cell, although one is a trifle smaller than the other. In addition to this method of propagating the species, there are various ways by which the plant forms a single large resting spore and recently it has been discovered (chiefly through the work of Castracane and Murray) that it is probable that the whole contents of a diatom cell may break up into a number of small spores, each one of which develops into a new plant.—*American Journal of Pharmacy.*

PLANT PHOTOGRAPHY.—The ranks of amateur photographers have, within the past few years, assumed wonderful proportions, and nearly all the details of production, heretofore known only to the professional, are being mastered as well by the amateur.

The small cameras, or "kodaks," as they are all generally termed, have made possible the creation of great interest in this art, and subjects of many kinds are brought into use. But one subject has been very greatly neglected,—possibly because more difficulties are encountered and that the knowledge of the subjects as individuals is limited. The reference is to the photography of plants.

Some amateurs delight to make a special study of portraiture,—others of architectural works, marine or landscape effects; many are entirely aimless in their efforts, other than to amass a collection of reproductions of familiar scenes. But very few, indeed, make plant life a chief study, which is to be regretted.

The movements of foliage and flowers in the wind, and the lack of contrast between them and the surrounding vegetation are the greatest difficulties to be surmounted. But it is just here that an interesting study may be developed.

Taking for example the wild flowers or trees as they may be seen in their natural haunts, good photographs will always be found interesting as well as instructive, and will awaken pleasant memories of some delightful summer stroll.

MEEHANS' MONTHLY desires to encourage this phase of amateur photography, and will gladly reprint interesting notes on the subject, as space will permit, from the experiences of its readers; and photographs, themselves, can be frequently reproduced with interest to the readers in general.

GENERAL GARDENING.

THE ROSE LEAVES OF MEMORY.

No, the roses soon wither'd that hung o'er the wave,
But some blossoms were gather'd while freshly they shone,
And a dew was distill'd from their flowers that gave
All the fragrance of summer, when summer was gone.

Thus memory draws from delight, 'ere it dies,
An essence that breathes of it many a year;
Thus bright to my soul, as 'twas then to my eyes,
Is that bower on the banks of the calm Bendemeer! MOORE.

SCHOOL GARDENS.—Believing that the mere memorizing and reciting of text-book lessons was not the best way to a proper development of the young the writer, more than a quarter century ago, advocated and aided in testing a system of instruction in which one half-day was given to literary exercises in lectures and conversations with objects, pictorial and chart illustrations, and one half-day to manual work in printing and binding, wood engraving, drawing and coloring charts, scroll sawing and turning. The system was called pantographic and the school the Philotechnic Institute. The boys and girls are now grown, and are giving strong testimony of the excellent system by their better work and greater success in the different occupations. By hand work while the muscles are young and more flexible, they acquire a degree of skill which they could not acquire in later years, and, as all organs grow strong to the work they are used for, the pupils can do more and better work than those educated by the common system.

As he did not succeed in persuading the directors of rural schools to adopt his system, he has rented a plat of ground near the Greenville School, and pays the pupils five or seven cents per hour, for time when they are not engaged in the school room, to help work in the garden. The price is not fixed by size or age, but by the qua ity of the work done. They are paid in stock which represents ground rent, manure, labor and the cost of the crops. The stock is guaranteed at one dollar per share and a dividend if there is any profit to divide. This gives them a direct interest in the work and makes the school garden a part of the greatest educational institution—the business world.—At the commencement we found pupils who could solve problems in fractions and the square root, but did not know how to get right angles for a poultry house, or the degrees of obliquity of the sun's rays so as to get the best angle on the south sides of ridges and secure the most value from the rays for early crops. They did not understand how to lay the lines for scientific plowing to turn the good ground towards the centre and leave the "dead" furrows next the fence for the weeds to grow in. With our work we propose to study the elementary principles of farming and natural sciences.

As showing the value of some knowledge of botany, an English farmer had to pay a drover for renting pasture with Digitalis in. He plead ignorance of the poison character of the weeds, but the court did not excuse him. Educated gardeners receive more than twice the wages of common farm laborers. When our State Agricultural Experiments were started, the board held a meeting in Camden. with a view of having a branch station there, and asked the writer to aid them in finding a person acquainted with plants and insects to place in charge; but we could find no one suitable, and the effort was abandoned. Dr. Cook, the director, said when in Norway and Sweden, if he found a strange plant or insect he could get its name from any laborer in the field, and it was the one thing which made him ashamed of his own country.

During the Centennial Exhibition, one of the English Commissioners, who made educational systems a study, said he was at first favorable to our public school system for its reduction or

illiteracy; but when he looked in our great industrial works he found the graduates employed on book-keeping, and the higher places filled by foreigners. The greatest objection made to manual training is that it takes from the time of literary studies; but from my observation I believe one hour with the pupils at work or play, when they use their own language, is worth more for the improvement than the whole day with memorizing and reciting the language of the text books on English grammar, or the bad pronunciation of the names of continental Europe, Asia and Africa, in the geographies.

In France, gardening is practically taught in twenty-eight thousand primary and elementary schools, each of which has a garden attached to it. In Sweden, in 1871, twenty-two thousand children received instruction in horticulture, and each of two thousand and sixteen schools had for cultivation from one to twelve acres. In Russia, many children are taught tree, vine, grain, garden, silk worm and bee culture.

In ancient Greece, a law required the son to support the aged father; but if the father had neglected to teach the son an occupation, the son was exempt from the obligation. Every primary, as well as all higher institutions of learning, should have a garden.

Camden, N. J RODOLFUS BINGAM.

ROSE, CRIMSON RAMBLER.—A photograph of a comparatively young specimen of the Crimson Rambler rose, growing by the porch of the residence of Mr. John G. Bullock, of Germantown, Philadelphia, leads to the remark that we may always look for the greatest line of improvement by the introduction of wholly new species from their native wilds. When once improved, nature holds the lines more tightly, and but little more improvement can be made on that which has been already improved. Here we have a grand improvement on the wild *Rosa multiflora*, of Japan, which has been known to botanists ever since the time of the great botanist Thunberg,—but as *Rosa polyantha*, it has but recently been introduced into gardens. The numerous white flowers of the latter, and subsequent crimson fruit, is attractive. But when the colored plate of the improvement, in the form of "Crimson Rambler," was first widely distributed by Ellwanger & Barry, it was only the high standing for accuracy which this great firm enjoys that secured full credit for it. It has the beautiful red flowers in large clusters, as their picture represented,—and that it is a good rambler or climbing rose, is evidenced by the three-year old plant given in our illustration. It is proving one of the most popular of the new introductions of late years.

CRIMSON RAMBLER ROSE

BEECH TREE BORERS.—During recent seasons correspondents have called attention to the different dates of leafage on the branches of the same beech tree. It is a curious sight to note perhaps half the branches in full leaf, the others remaining dormant for many days afterwards. This season, the writer discovered that this was owing to the existence of a borer in the tardy branches. The branches, in many cases, are as hollow as a bamboo. It is well known, to experienced gardeners, that the most highly vitalized branches are the earliest to leaf. In all trees, some individuals leaf earlier by several days than others. Under equally unfavorable conditions, as, for instance, transplanting, the earlier leaved are the last to succumb.

These beech borers are of considerable size, and do not seem to be in great numbers on any one tree,—and yet the tree will die in time from their attacks. It ought not to be difficult to destroy them by thrusting a wire into their holes.

It does seem that not only to the weeds are we under obligations to get our living by the sweat of our brows. Insects and minute funguses may claim a portion of battle in their interest. It will soon be found as essential to good gardening to keep a force of men at insect-killing and fungus-destroying, as in a force to hoe weeds.

THE CHINA TREE.—In speaking of the Camphor tree as a street tree in New Orleans, it reminds me of a street tree I saw in Vicksburg, while we were "holding the fort," called the "China tree." It was beautiful while in bloom, but round-headed, and not very graceful as a street tree. I never saw it growing elsewhere. Does the Editor of the MONTHLY know anything about its history, etc.?

Oberlin, Ohio. G. N. CARRUTHERS.

The so-called "China tree" is indigenous to the Himalayan Mountains, and extends in Asia to Cochin-China. It is, botanically, *Melia Azedarach*, the genus being the type of the order *Meliaceæ*, of which we have no representative. It is often cultivated in the Southern States, and has become wild in many instances. As our correspondent suggests, it is a coarse, ungainly tree, when leafless; but its sweet lilac-colored flowers are a fair compensation. It must have been exceptionally cold in New Orleans to kill the Camphor tree,—or there may have been depressing conditions in connection with the frost, as it is surely capable of enduring 10° or 12° of cold without injury.

FRUIT OF THE OLEANDER.—In my note on the fruit of the Oleander, page 68, I said that the weight of fifty seeds was 22 *grams*—not grains, as you have it. Please make the correction. I may further add that some of the seeds were planted and the percentage of germinations was good. E. E. BOGUE.

Stillwater, Okla.

EULALIA GRASS FOR INDOOR DECORATIONS.—If promptly placed in water after being cut, the leaves and plumes of the *Eulalia Japonica* make a fine decorative effect. Take an entire clump or equal bulk of single stems, which place in a good, large umbrella stand filled with water. In the case of the plumes, to keep them from "falling," they must be cut before they are thoroughly ripened, when they will last for years in a vase without water. For some reason—possibly because their height usually makes them more exposed to the winds—*Eulalia Japonica* (plain, green-leaved) and *E. var. zebrina* fall very quickly, and must be cut earlier than the others.

DWARFING TREES.—Inquiries are often made as to how the Japanese dwarf trees. One of these people tells the *Gardeners' Chronicle* that they simply pinch out the new growth as fast as it appears, by the use of finger and thumb only. They re-pot once in two or three years, cutting out all the weak roots, but carefully saving the strong ones, carefully well-draining before returning the plant to the same pot. They manure with oil-cake, bone meal, or some such concentrated material, twice a month, except in the two hottest months of the year.

WEEDS AND ORNAMENTAL PLANTS.—That what may be a valued ornamental plant in one part, may be regarded as a pernicious weed in another, is well exemplified in our pretty garden Lantana, *Lantana Camara*. Few ornamental plants are more highly prized in northern gardens. But in his recent "Flora of the Sandwich Islands," Mr. A. A. Heller has this to say of it: "This species has become the

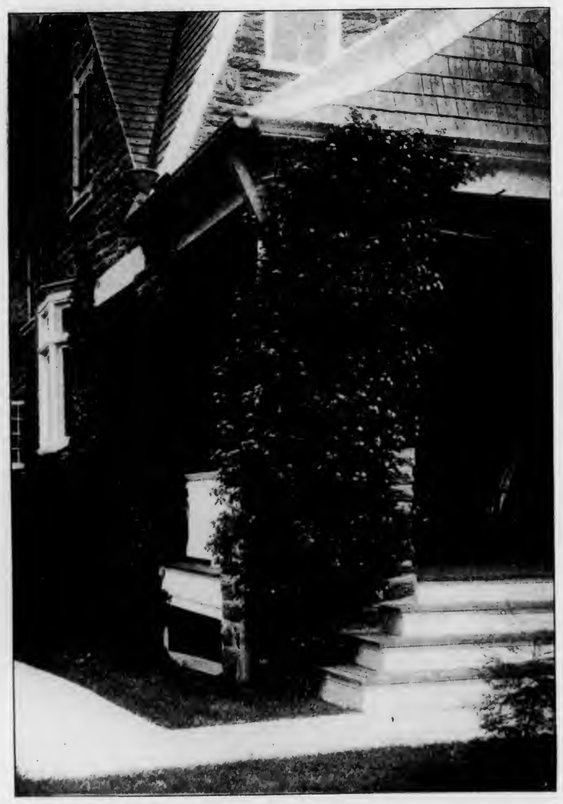
illiteracy; but when he looked in our great industrial works he found the graduates employed on book-keeping, and the higher places filled by foreigners. The greatest objection made to manual training is that it takes from the time of literary studies; but from my observation I believe one hour with the pupils at work or play, when they use their own language, is worth more for the improvement than the whole day with memorizing and reciting the language of the text books on English grammar, or the bad pronunciation of the names of continental Europe, Asia and Africa, in the geographies.

In France, gardening is practically taught in twenty-eight thousand primary and elementary schools, each of which has a garden attached to it. In Sweden, in 1871, twenty-two thousand children received instruction in horticulture, and each of two thousand and sixteen schools had for cultivation from one to twelve acres. In Russia, many children are taught tree, vine, grain, garden, silk worm and bee culture.

In ancient Greece, a law required the son to support the aged father; but if the father had neglected to teach the son an occupation, the son was exempt from the obligation. Every primary, as well as all higher institutions of learning, should have a garden.

Camden, N. J RODOLFUS BINGAM.

ROSE, CRIMSON RAMBLER.—A photograph of a comparatively young specimen of the Crimson Rambler rose, growing by the porch of the residence of Mr. John G. Bullock, of Germantown, Philadelphia, leads to the remark that we may always look for the greatest line of improvement by the introduction of wholly new species from their native wilds. When once improved, nature holds the lines more tightly, and but little more improvement can be made on that which has been already improved. Here we have a grand improvement on the wild *Rosa multiflora*, of Japan, which has been known to botanists ever since the time of the great botanist Thunberg,—but as *Rosa polyantha*, it has but recently been introduced into gardens. The numerous white flowers of the latter, and subsequent crimson fruit, is attractive. But when the colored plate of the improvement, in the form of "Crimson Rambler," was first widely distributed by Ellwanger & Barry, it was only the high standing for accuracy which this great firm enjoys that secured full credit for it. It has the beautiful red flowers in large clusters, as their picture represented,—and that it is a good rambler or climbing rose, is evidenced by the three-year old plant given in our illustration. It is proving one of the most popular of the new introductions of late years.



CRIMSON RAMBLER ROSE

BEECH TREE BORERS.—During recent seasons correspondents have called attention to the different dates of leafage on the branches of the same beech tree. It is a curious sight to note perhaps half the branches in full leaf, the others remaining dormant for many days afterwards. This season, the writer discovered that this was owing to the existence of a borer in the tardy branches. The branches, in many cases, are as hollow as a bamboo. It is well known, to experienced gardeners, that the most highly vitalized branches are the earliest to leaf. In all trees, some individuals leaf earlier by several days than others. Under equally unfavorable conditions, as, for instance, transplanting, the earlier leaved are the last to succumb.

These beech borers are of considerable size, and do not seem to be in great numbers on any one tree,—and yet the tree will die in time from their attacks. It ought not to be difficult to destroy them by thrusting a wire into their holes.

It does seem that not only to the weeds are we under obligations to get our living by the sweat of our brows. Insects and minute funguses may claim a portion of battle in their interest. It will soon be found as essential to good gardening to keep a force of men at insect-killing and fungus-destroying, as in a force to hoe weeds.

THE CHINA TREE.—In speaking of the Camphor tree as a street tree in New Orleans, it reminds me of a street tree I saw in Vicksburg, while we were "holding the fort," called the "China tree." It was beautiful while in bloom, but round-headed, and not very graceful as a street tree. I never saw it growing elsewhere. Does the Editor of the MONTHLY know anything about its history, etc.?

Oberlin, Ohio. G. N. CARRUTHERS.

The so-called "China tree" is indigenous to the Himalayan Mountains, and extends in Asia to Cochin-China. It is, botanically, *Melia Azedarach*, the genus being the type of the order *Meliaceæ*, of which we have no representative. It is often cultivated in the Southern States, and has become wild in many instances. As our correspondent suggests, it is a coarse, ungainly tree, when leafless; but its sweet lilac-colored flowers are a fair compensation. It must have been exceptionally cold in New Orleans to kill the Camphor tree,—or there may have been depressing conditions in connection with the frost, as it is surely capable of enduring 10° or 12° of cold without injury.

FRUIT OF THE OLEANDER.—In my note on the fruit of the Oleander, page 68, I said that the weight of fifty seeds was 22 *grams*—not grains, as you have it. Please make the correction. I may further add that some of the seeds were planted and the percentage of germinations was good. E. E. BOGUE.

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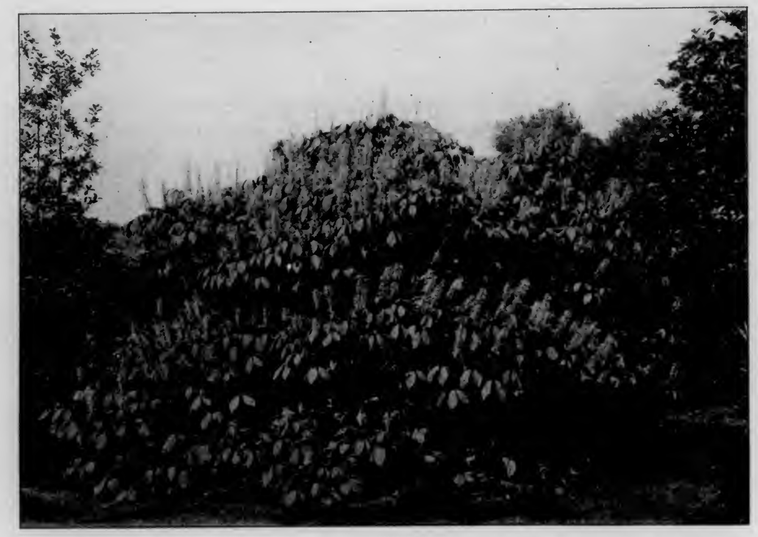

PAVIA MACROSTACHYA.

PAVIA MACROSTACHYA.—Under the common name of Dwarf Horse Chestnut, the beautiful shrub, here illustrated, has long been known in leading nurseries. It belongs, however, to the genus *Pavia*, the buckeye section, rather than to the *Æsculus* or Horse Chestnut class. The latter has broad, spreading petals and prickly fruit; while the buckeyes have irregular, stalked, erect petals, and smooth fruit. The large spikes of pinkish-white flowers, densely set on the rachis, in contrast with the somewhat drooping leaves, always attract admiration. It is a magnificent shrub, blooming in June, and thoroughly hardy, though native to the mountains of Georgia. It is particularly useful for planting in partly-shaded places.

HARDY FUCHSIAS.—The following letter, received by the Senior Conductor, will doubtless prove interesting to our readers:—

"I read an interesting account in reference to you, in a recent issue of the Philadelphia *Record*, to which, no doubt, your friends have drawn your attention. If they have not, it is to the effect that a person (a lady, I believe) at a meeting of the Psychological Circle, stated that she liked you, although she has not had the pleasure of seeing you. She claims a bond of sympathy between you and herself, on account of similar experiences you both have had, which is to the effect that you 'had certain pet flowers, and your pet flowers always died in spite of every care and attention.' It would be interesting to know what are your pet flowers that always die. If such is really a fact, which I am inclined to doubt, the same reasons for death in your pets are not the same as are those of this member of the Psychological Circle.

"A personal experience of my own, I think, will interest you. I was always fond of the Fuchsia, and, twenty-five years or so ago, I took great interest in them, as they responded gratefully to generous and intelligent treatment, more so, I at that time thought, than any other plant. Two years ago I took a notion to renew my acquaintance with them, and secured a few varieties. After the experiment was over, and not having room in the greenhouses for them, and not caring to throw them away, I planted them outdoors last September, along the northeast side of my residence. Forest leaves were plentifully used as a mulch, and now, although the tops of the plants are dead, quite a number of them are throwing healthy and hearty shoots from the base. Mr. Wm. K. Harris related to me that he had made a similar experiment with the same results. It is not generally known, I think, that Fuchsias may, with a little care in the fall, be made to live all winter. This may or may not be of some practical value, but in any case, I knew you would be interested, and that is my reason for writing to you on the subject."

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The experience with the Fuchsia is valuable. In the case of many things it is not so much the bursting of the tissues by expansion through frost, as it is the drying out of the sap by cold wind and bright light. If evaporation is guarded against, no injury results. Hence, figs, raspberries, roses, crape myrtles, and other plants, are bent to the ground and buried under the earth in the fall, the thermometer above them may fall far below zero without injury. It is possible to have a Fuchsia live out many seasons, and get many feet high, by being bent over and covered by earth.

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In our public parks and pleasure grounds, particularly, is the want of judicious thinning painfully evident, as a rule. The great public has been taught that to cut away a tree is a mortal sin never to be forgiven, and there are few managers courageous enough to brave this exaggerated condition of public opinion. It is the same with our street and boulevard trees. They have to be set closely to meet the demand for speedy shade. They soon meet, and unable to spread horizontally, struggle upwardly, until the "tree-butcher" becomes a public blessing in beheading them with hatchet and saw.

In almost all newly-planted places, an intelligent landscape gardener should be called in to advise with after a period of about ten years,—and a second inspection should be arranged for after another similar period. The "joy for ever" that we read so much about would be an actuality whenever the beautiful trees and shrubs were looked upon.

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INTENTIONAL SECOND EXPOSURE

NEW OR RARE PLANTS.

THE BABYLONIAN WILLOW, — THURLOW'S WEEPING.—As now is generally known, the so-called willow of Babylon is a Chinese plant, and, like most Chinese plants, is not hardy under very severe conditions. In Massachusetts and other localities in the North, it does not endure the winter climate. All kinds of plants are liable to sport,—not only in the color of the flowers, and character of the leaves, but in habit and hardiness. Mr. T. C. Thurlow, of West Newbury, Mass., was fortunate enough to find a sport among his stock of Babylonian willows, with a more erect habit than usual, and which proved of extra hardiness. A photograph of the original tree is here reproduced. It was taken in 1895, and is said to be a model of beauty now. In the report of the Nebraska State Horticultural Society for 1893, is the following account reported by one who had cuttings a few years before for the Experiment Station at Franklin, Neb. :—

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SYRINGA OBLATA.—This new lilac, *Syringa oblata*, is a native of China, but has but recently been introduced into American nurseries. Its blossoms, and indeed its whole appearance, including its fragrance, remind one of the common Siberian lilac of our old gardens. It is earlier in flower. Near Philadelphia, the children always look forward to lilacs for May-day. They were disappointed this year. At this writing, May 4th, they are not open. *Syringa oblata*, or Chinese lilac, has been open for a week.

THE HARDY FLOWER GARDEN.

NATURAL BOUQUETS.—There are some hardy flowers produced in large panicles, making in themselves a well-formed bouquet, one of the finest of which is the *Helenium*. The huge bunch of flowers produced on a single stem will occupy most ordinary size vases and make a handsome display. These stems may vary from 4 to 6 feet in length, and are very stiff, capable of bearing the head of flowers perfectly. Their use for decorations is apparent. The flowers are long-lasting. *Aster Tataricus* also makes very large panicles on stout stems; *Aster Novæ-Angliæ* is likewise useful, and the color perhaps better for that purpose. Some varieties of the tall perennial *Phlox* produce pretty large panicles. Among trees and shrubs there are few with extremely large panicles suitable for decorations. The Japanese Hydrangea is perhaps the best of all, and to secure large heads there must be strong, vigorous growth, encouraged by close pruning in the winter.

SPOTTED ARCHANGEL.—In the old-fashioned gardens one of the most welcome of spring flowers was the *Lamium maculatum*, or the Spotted Archangel, as the old folks termed it. The leaves have a white spot down the centre of the leaf, which gives it both the scientific name maculate and the common. It remains continuously in bloom from the first awakening of the flowers till past midsummer, though the later flowers on the spike are not so attractive as the earlier ones. It grows well in the herbaceous border, either in sun or shade, though rather preferring the latter in our country.

DESMODIUM PENDULIFLORUM.—There seems to be some difference of opinion as to whether or not this plant and *Lespedeza bicolor* are one and the same, and for the benefit of many of your readers, I will give my experience in regard to them. Three years ago, a plant of *Lespedeza bicolor* was purchased, and on its blooming we found that one of our old friends of the garden had appeared under a new name as *Desmodium penduliflorum*. The plant in our collection was exactly similar in the minutest detail. The plant has been on this place for fifteen years, at least. I do not see the white variety offered, although we have both, and think the white very beautiful. It increases very rapidly, indeed, and is a very nice companion to the purple variety. It is hardy without any protection here, and, I have

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no doubt, further north than this, provided it be given a light, well-drained soil. Planted in an open space and supported by rings of wire, it makes an elegant subject. It is cut to the ground every year by frost, as most perennials are, and is a little late starting to grow. To-day (May 24th) it is two feet high, and has twenty growths, which mean a thing of beauty in the early fall. All who possess the purple variety should, if possible, procure the white. The white, especially, is beautiful for cut-flowers. This proof of ours, by trial of both plants, ought to establish the fact that *Lespedeza bicolor* and *Desmodium penduliflorum* are one and the same plant.

I have since noticed, in Henderson's Handbook, that, when introduced from Japan, it was first distributed as *Desmodium penduliflorum*.

Rahway, N. J. A. P.

This was a case of mistaken identity,—and is not to be classed with the changes of name, now so common, in order to do honor to some obscure botanist. The plant is a true *Lespedeza*, and not a *Desmodium*, as the German botanists thought, who first got hold of it. It has been so widely distributed by nurserymen under the erroneous name that it has been found difficult to make the correction.

FRUITS AND VEGETABLES.

Profits from Strawberries.—It is said that a person with a small garden at Manhattan, Kansas, set out 1,025 strawberry plants, and sold the products, keeping an account of receipts and expenditures. These plants occupied one-sixth of an acre. On this it is officially announced that in Kansas, strawberry growing will net the cultivator $796 an acre clear of everything. One might readily show, by taking a square yard instead of a larger tract, that very much more than that could be obtained "per acre," yet it is safe to say that no one ever has, or ever will realize a clear profit of $796 per acre from strawberries.

Cranberry Growing.—Cranberry growing, in Nova Scotia, is said to be profitable when free from insect attacks; but these, of late, have been so numerous and troublesome, that the profits of cranberry culture there are said to be precarious.

A Ladder for Fruit-Picking.—Anyone who has done much picking of fruit from large trees, using an ordinary ladder, knows how inconvenient a thing it is to handle in moving it around to various portions of the tree. The long top round makes a breadth which, with the two projecting points—the ends of the side strips—makes an awkward thing to thrust in amongst the branches. The best style of ladder is that which brings the top up into a decided point, which is easily placed anywhere amongst the branches, and quickly. But if instead of a finished point it simply runs to a short round,—say four inches long,—it will not be very awkward to handle, and will enable its being placed more securely against limbs running more or less perpendicular.

Asparagus.—Among the simple facts of gardening, the most widely know is the one that healthy leaves are essential to the growth of plants. If a plant be deprived of its leaves as they push out during a whole growing season, that plant will surely die. This question often comes in when the proper management of an asparagus bed is considered. If we cut every sprout as fast as it appeared to the end of the year, there would be little growth the season following. The rule is to cut everything as it appears up to about midsummer, or up to what one might term the end of the asparagus season, and then let the sprouts that follow go on and make foliage for the strengthening of the plant. Much, however, will depend on the strength of the plants themselves. The younger and weaker the plants, the longer should be the later season in which they are to be allowed to enjoy the benefits of strengthening foliage.

Scraping the Old Bark of Fruit Trees.—Trees have no more use for old bark than for old leaves. In every healthy tree, nature provides means for getting rid of it, but these are not always as active as they should be, and art has to help where nature fails. Hide-bound trees, and scaly-barked trees, must be assisted by washes, and by scraping where the old bark is scaly and does not pass freely away. This is the plan for temporary relief. But a permanent care is by liberal manuring. A tree in prime vigor will take care of its own useless bark.

Sweet Celery.—Mr. N. J. Johnson tells the South Minnesota Horticultural Society, that it is not so much the bleaching process that takes the bitterness out of celery, of which so many complain. What the celery plant requires, to have it nutty and crisp, is a rapid growth in autumn. To secure this, the plant must have an abundance of manure and plenty of moisture. With this, he has good crops from double rows, with the plants six inches apart, and side-boards instead of earth for blanching.

To Get Rid of Tent Caterpillars.—Prof. Greene, of the Experiment Station, Minnesota, says:—"The Tent Caterpillar has occasionally been somewhat injurious in our orchards, but a little attention has prevented our having any serious trouble from this cause. Our best remedy has been the destroying of the egg clusters, which may be easily seen in the branches in winter and early spring, and in gathering the worms in their tents as soon as they hatch out. It should be generally understood by our people that a dozen apple trees well planted and cared for will produce more fruit and be far more satisfactory than a large number of trees set out in the ordinary, neglectful way."

Fruit-Packing from Several Standpoints.—What makes it necessary that almost every house-keeper, in buying packages of fruit, should find it necessary to have a package tilted up for view of the contents towards its centre? Simply to see that it corresponds with those on top,—an indication that the fruit-packer is inclined to deceptive methods. That a large majority of fruit packages are "topped" with specimens superior to what will be found further on, will be generally acknowledged. It is not always the fault of the fruit-grower; it may be done by the commission-man, the store-keeper or the huckster. Is it not deplorable that honesty and fair-dealing cannot be extended to the handling of fruit as it is in other lines of trade? Or is it that some do not consider it dishonest or unfair to display what is practically a sample of fruit and then deliver something more or less inferior? Judging by the remark of a commission merchant made before the State Horticultural Association, where he advised fruit-growers to "top" their packages, evidently the gage of morality differs among people. In quite another tone, another speaker at the same gathering advocated the desirability of putting up fruit in the most attractive manner, but absolutely uniform as to quality and grade. It is that which makes Californian fruit saleable in Eastern markets, and by no means its quality. This careful method of handling is of no use unless the consignments from a grower be individualized by a seal or brand, through which the consumer may learn that fruit from that grower is to be relied upon. There would be waste in sorting out inferior fruit,—though, kept separate, some disposition could be made of it with a smaller monetary return; while the higher graded fruit should bring more money. It is with the same idea of raising the standard of his fruit, and increasing its value, that the intelligent grower of peaches and plums finds it advantageous to thin out the fruit on an overloaded tree, rather than use props and get more but inferior fruit. Where a certain grower's fruit can be recognized and can be depended on to be first-class throughout, or at least uniform from the top of the package to the bottom, the consumer should show his appreciation of a desire to give good service, by bestowing his patronage on that person.

Improved Cuban Queen Watermelon.—The old Cuban Queen Watermelon has long been recognized as the leading shipping and commercial melon of the country. I have a sport of this melon that far supercedes the old Cuban Queen. The new melon is the wonder and admiration of all who see it, as it is a third larger than the old variety; and for sweetness and delicious flavor it stands unrivalled. In fact, melon growers of varied experience pronounce it the greatest watermelon ever grown. Single vines perfect from six to eight melons, averaging in weight from 75 to 120 pounds.

The seeds of this melon are brown. The flesh is the most vivid crimson red, melting and sugary. These melons are the greatest shippers known, also marvelous keepers. The vines are rampant, vigorous growers, and very healthy. This is the melon for the millions, as it succeeds on all soils.

I have tried all melons as fast as they originated, and were disseminated; but none equals this new melon. S. L. Watkins.

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WATER CHINQUAPIN.

NATURAL ORDER, NYMPHACEÆ.

NELUMBIUM LUTEUM, Willdenow.– Corolla pale yellow,—anthers tipped with a slender hooked appendage. Leaves usually raised high out of the water, circular in outline, with the centre depressed or cupped, one to two feet in diameter. Flower five to ten inches broad. Tubers farinaceous and edible. Seeds also edible. Embryo like that of *Nymphæa* on a large scale. Cotyledons thick and fleshy, enclosing a plumule of one or two well formed young leaves, enclosed in a delicate stipula-like sheath. Gray's *Manual of the Botany of the Northern United States.* See also Chapman's *Flora of the Southern United States*, Wood's *Class-book of Botany*, and Britton and Brown's *Illustrated Flora of the Northern United States, Canada and the British Possessions*, under the name of *Nelumbo Nelumbo.*

The Sacred Lotus, *Nelumbium speciosum*, has a famous place in history. In our times, flowers are prominent incidents in festivals,—in the long past, they seem to have been the essential features, especially in religious ceremonies. In this class appears the *Nelumbium*, or, as it is often called, the Lotus or Sacred Bean, especially among the Asiatic races. The American *Nelumbium*, herewith illustrated, is practically the same as the Asiatic species, the only difference is that in the American there is a small appendage at the apex of the stamen. In color, the American is yellow, rarely white, —the Asiatic is rose color, or occasionally white or bluish. So far as the American species is concerned, there seems to have been no special reverence in regard to it by the aborigines. The roots very much resembling sweet potatoes, and the acorn-like seeds, being in request for food,—and the dried seed vessels serving as rattles for the papooses.

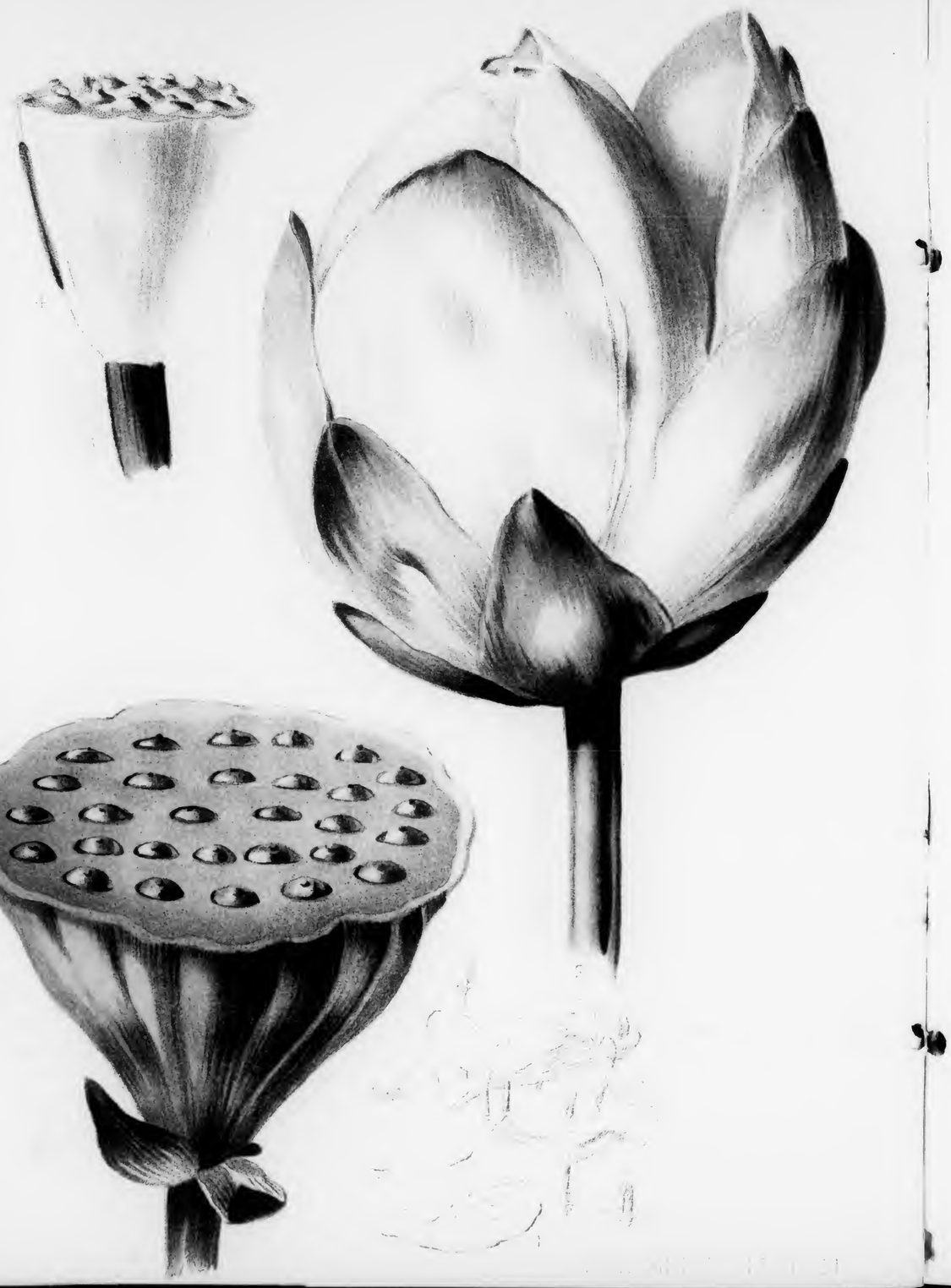
The two allied species go very often under the style of the Sacred Bean or Lotus of the Nile,—but this is a mistake. The *Nymphæa Lotus* is the Lily of the Nile, though the Sacred Bean of India, the *Nelumbium*, appears to have been introduced to the famous river of Egypt, and to have been somewhat common in the days of Egypt's greatness, though it has seemingly disappeared in modern times.

It must be confessed that the true *Nelumbium* may have been indigenous to Egypt, if we rely on the histories of the manners and customs of the people as reported to us. We are told that the lotus was a favorite flower in making wreaths, and that at social gatherings a lotus was the favorite flower to present to guests, as a rose or carnation would be to-day. Further, we are told that necklaces of lotus flowers were marks of distinguished honor,—and that garlands or head-dresses of flowers were so arranged that a single lotus bud or full blown flower hung in the centre of the forehead. Sir G. Williamson, regarded as an authority on Egyptology, says that vases filled with lotus blossoms were the special prerogative of the master of the house. Accepting these statements as correct, they must refer to the *Nelumbium*, as the transitory nature of *Nymphæa* flowers would unfit them for serving such purposes.

The name *Nelumbium* is derived from the vernacular East Indian name, "*Nelumbo.*" Indeed, the earlier botanists adopted the name for the genus; but with the reorganization of botany, in the times of Linnæus and Jussieu, it was thought desirable, as far as possible, to reduce to Latin form all generic names, and so the last-named distinguished botanist rendered *Nelumbo, Nelumbium.* This was generally accepted, and Willdenow, another famous author, describes our plant as *Nelumbium luteum.* In describing the genus, he remarks that *Nelumbium* differs from *Nymphæa*—our common water-lily—in the numerous pistils, sitting with their fruit on the receptacle, showing in this some affinity with the strawberry.

Aside from the size of the flowers, and general peculiarities, there is little of beauty to awaken enthusiasm in the lotus. Percival makes his Frenchman prefer a humbler competitor for human affection:—

COLOR PLATE



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COLOR PLATE
INTENTIONAL SECOND EXPOSURE

"I ask no deep-encrimsoned flower
From India's never-fading bower;
No lotus, where it closely weaves
The Ganges with its azure leaves;
I ask no pensive bud of woe,
That gives the night its wreath of snow;
All these may have a charm,—but yet
Thy charm is more, Sweet Mignonette."

Even its life-history is almost a blank chapter. When Longfellow, in Evangeline, chants:—

"Thus 'ere another noon, they emerged from the shades; and before them
Lay, in the golden sun, the lakes of the Atchafalaya.
Water-lilies in myriads rocked on the slight undulations
Made by the passing oars, and, resplendent in beauty, the lotus
Lifted her golden crown above the heads of the boatmen."

No one has been able to say with certainty that the lotus never lifts its crown so high. Prof. Porter, however, on a visit to a locality for the flower in Sussex County, N. J., in 1878, did venture the remark, from what he saw there, that Longfellow had committed a practical exaggeration pardonable in a poet. And yet it has been before the lover of flowers longer than most of the natives of our country. Leonard Plukenet, in his "Phytographia," published in 1691, gives a good figure of it, and describes it as the nut-bearing *Nymphæa* of Virginia, with large flowers of a pale yellow,—this, no doubt, from some drawing furnished him. It is credited as being introduced to British gardens in 1810; but, up to 1824, Sir William Hooker had never seen it, as the author notes by an autograph letter addressed to Zaccheus Collins, Vice-President of the Academy of Natural Sciences of Philadelphia. Growing near Philadelphia, he asks Mr. Collins to send him some. So early as 1750, we find Peter Collinson reminding John Bartram that the "*Faba Ægyptica*" had been found near Philadelphia by Peter Kalm, and asks Bartram to send him some. In 1760, he scolds Bartram. "This reminds me," he says, "of the elegant species of water-lily that is in the Jerseys. Does it occupy such a depth of water that the roots can't be come at? Thou art ambitious of plants from us: but here is the most charming plant of Asia, including China and Egypt, in thy neighborhood; and yet so little is thy curiosity, or industry, that thou canst not avail thyself of so great a curiosity. Thou that hast springs in thy garden to make a pond for its reception, or a river close by, if more proper for its culture. Prithee, John, nevermore let me reproach thy want of taste or curiosity in this article. If I was in thy place, I should spare no pains or expense to be possessed of a curiosity that none in thy province could boast of besides thyself; which thou art ambitious of in other plants in no comparison so charming when in flower." Until Kalm found it at Philadelphia, Collinson says, it was only known as from Carolina. During the latter part of the century just closed, botanical literature teems with notices of locations discovered in many parts of the seaboard States of the Union, and of Canada.

In a letter to the author, dated August, 1878, in speaking of the discovery of the plant in Lake Calumet, Mrs. E. M. Brackett, of Chicago, graphically describes the seed-vessel as "resembling the rose of a water-pot," and had been informed by one versed in Egyptian history, that the *Nelumbium* was artificially cultivated in the Nile, in the early ages, by putting a seed within a ball of clay, and dropping the ball in the river where a plant was desirable.

In regard to culture, some interesting facts were contributed to the *American Naturalist*, ninth volume. In 1872, seeds were sown in an aquarium. Only one germinated that year,—the others did not grow till four years and a half later. The remarkable fact was that the seed came to the surface to sprout, then sank to the bottom, from which it sent up petioles and leaves, but no root down into the mud at that time. Something of this sort is recorded by Dr. W. C. P. Barton, in his Flora of America, in 1822. He describes the seeds as viviparous, sprouting in the receptacle, which he says breaks off at the summit of the peduncle, and then floats away, and in this way the plants are widely distributed over the lakes or ponds where they grow. After sprouting, they drop in the mud.

EXPLANATION OF THE PLATE.—1. Miniature sketch, taken by the artist, Mr. Alois Luzer, at Woodstown, N. J., for Messrs. Prang, showing all conditions of the growing plant. 2. Full-sized bud ready for expansion. 3. Torus, from a flower about to fade, with the stigmas in receptive condition. 4. Stamen, showing the peculiar appendage at the summit of the anther, distinguishing the American from the Asiatic species. 5. Torus, nearly mature, showing by the ridges that it is composed of a number of consolidated carpels.

WILD FLOWERS AND NATURE.

THE WALKING FERN.

"Down the rock comes the walking fern,
There stands in the pool the listening hern,
And even the gaudy butterfly
Pauses awhile as she flaunteth by,
And a lesson to all unconsciously gives,
Through the useless and frivolous life she lives."

HOWARD WORCESTER GILBERT.

IDENTIFICATION OF OSMUNDA REGALIS.—The fern sent the conductors, from Long Island, for identification, proves to be *Osmunda regalis*, the beautiful King Fern. It is a water-loving plant, and at home may be seen growing to a height of five feet. Though the fronds are delicate, it transplants readily.

NELUMBIUM LUTEUM.—Regarding *Nelumbium luteum*, it may be further noted that a singular fact in the life-history of the plant is related by Charles F. Cox, in the *American Monthly Microscopical Journal* for 1880. Hairs are found in the hollow spaces of the petiole in the *Nymphæas*, but not in the *Nelumbium*. This may be owing to the manner in which the petiole is formed. A petiole, morphologically, is but the uncoiled leaf-blade. Whether it is incurved or recurved in the formation would tend to include or exclude the hair. In Vol. 7 of the Bulletin of the Torrey Botanical Club, Mr. H. H. Rusby notes that the leaves look like two long rolls before the expansion of the blade. It would appear from this that the condition was incurved.

The seeds are about the size of the Chinquapin, and from this the plant has received the name of Water Chinquapin, in America. They, however, more nearly resemble the acorns of the Pin Oak. Wild ducks are very fond of them.

Mr. L. B. Case, in the "Botanical Index," describes the sweet-potato-like roots as having a number of hollow spaces, running longitudinally with the tuber, and that when cut across the tubers exude a large amount of milky juice. The farinaceous matter is very abundant. There are no buds on the tubers,—growth takes place from the junction of the tuber with the main stem, as in the dahlia,—and the failure of the plant to grow when removed is probably due to the oversight of this fact.

HONEY GUIDES IN THE DARK.—There is a hypothesis, though scarcely satisfactory to some thinkers, that certain color-spots or lines in flowers are provided as guides to the nectaries of honey-secreting flowers, in favor of insect visitors. But the arguments against this are often as weak as those in favor thereof. For instance, it has been asked how the night-flying insects make use of honey-lines in the dark! But surely nocturnal insects are supposed to see as clearly by night, as the diurnals do by day.

CAVE PLANTS.—I remember reading, in Mrs. Ketchum's "Botany," that certain translucent ferns are found growing in limestone caves in Florida. I cannot now recall the name of the species. G.

WANDERINGS OF PLANTS.—Plants, like animals, are continually wandering to fresh fields and pastures new. Prof. Kellerman finds that of the present flora of Ohio, no less than 430 are immigrants. Almost all are from Europe.

SYMBIOSIS.—A recent inquiry, in regard to a root fungus being essential to the healthful growth of the heather, has attracted the attention of our readers. The *Journal of the New York Botanic Garden* states that mycorhiza—root fungi—are found in connection with all orchids. The fungus prepares the food for the orchid,—and the orchid returns to the fungus starch and sugar, on which its growth depends.

HORNETS' NESTS.—Many years ago, the writer of this made a communication, to the Academy of Natural Sciences of Philadelphia, noting that, in the preparation of the paper for their nests, the hornets chewed up the bark

of the ash tree. Since that time, no other tree, in the same vicinity, seems to have been used for that purpose. There must be hornets in some places where there are no ash trees,—and it would be well to know what tree is used in these cases. There is a good chance here for watchful observation.

THE INDIAN GROUND-NUT.—Photography can be easily learned. Anyone can take a snap-shot of some object. But the true artist is rare among the camera fraternity. We have pleasure in presenting to the reader a representation of the Indian Ground-nut, taken from a photo by Mr. C. E. Pleas, of Chipley, Florida. The plant was selected from a group at St. Andrews Bay, Fla. No more accurate representation of the *Apios tuberosa* has ever appeared,—while as a picture, merely, it will commend itself to the lover of art, though he may not know a bean from a butterfly. The photograph was taken during a rain.

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MODIFICATIONS IN PLANTS AND ANIMALS.—Botany has an advantage over zoology in the discussion of matters connected with variations, in this that aberrations from the normal conditions are more numerous and capable of closer investigation. Yet there are frequent instances of remarkable variations from usual forms in the animal world. In Germantown, near Philadelphia, a Mr. Bichy, a druggist, had a fondness for raising tadpoles in an aquarium, and watching their development to frogs. One tadpole, a few years ago, did not shed its tail, as it usually does. Not having lost it at the usual period, it continued as a caudal appendage the whole of the creature's life—five years. It grew to the usual size of these creatures,—but, while the hind pair of legs developed as usual in frogs, no forelegs ever appeared. The head continued in tadpole form, except that the lower part became loose and fluffy, as in frog-life.

A fact like this would indicate to some of the modern schools of philosophy an argument in favor of progressive development as to the origin of the various species of plants and animals. To another class it would seem that species might originate by a suppression of energy in some directions, and an enlarged effort in another, but affords no evidence of the origination of any new organ, such as many modern scientists understand by evolution.

GENERAL GARDENING.

THE MIGNONETTE.

The rose may sparkle in the morn,
And blush and brighten on its thorn;
The gaudy tulip proudly spread
Its glories o'er the enamelled bed;
The iris imitate the bow,
That sunbeams on a tempest throw;
All these may shine around,—but yet
I love my darling mignonette.

PERCIVAL.

MYROBALAN PLUM FOR HEDGES.—Regarding your notes, in the June issue of the MONTHLY, on the Myrobalan Plum as a hedge plant, I would say that such a hedge fence has been tried here. It was planted in 1893, and has for the last four years been a beautiful hedge, pruned to a height of some 5 feet. It makes a splendid hedge fence, as no one—or even stock—will attempt to go through it. It responds well to pruning, and, so far as the writer has seen, has never been troubled with the plum borer; but alas, the San José Scale has proved a worse enemy to contend with here, and where there is any danger of the hedge being infested with this pest, I have no hesitation in saying that the Myrobalan Plum will prove a grand failure.

Greenwich, Conn. JOHN W. DUNCAN.

CAMPHOR TREE AND HARDY FUCHSIA.—On page 103 I notice you speak (or your correspondent, G. N. Carruthers), of the cold having killed the Camphor tree at New Orleans. One year ago last February, I planted one at Veron, Onslow Co., N. C., and, visiting there last February, found it had not only grown, but had made a growth of more than 2 ft. 10 in. high. When set out, it had grown at least to a height of from 2½ to 3 ft., freely branched, not a twig or leaf blighted or harmed, and of course in full leaf looks much like a young wild cherry. We had frost of 12° below freezing for two or three days. The last two nights I covered it with thin muslin. The leaves looked frozen, hanging down, but did not seem in the least harmed two weeks afterwards. As you state, China Tree seems quite at home there.

Hardy Fuchsias, on page 104:—Some twenty years ago, I visited my mother's birth-place on Loch Awe, Argyleshire, Scotland. By a wall, on the old farm, facing east, was a plant growing along some 20 or 30 ft., 5 to 6 ft. tall, covered with small red buds, which attracted my attention. On examination, I found it to be a fuchsia with very small flowers. I afterwards found it was used as a hedge plant, occasionally, or screen.

I have two lespedezas growing finely, considering seashore and other conditions.

West End, N. J. EWEN MCINTYRE.

ROSE, CRIMSON RAMBLER.—The London *Gardeners' Chronicle* notes a plant of the Crimson Rambler, at Bicton, that had about 700 clusters of flowers on it at one time. This was far surpassed by a Philadelphia specimen the past season, which had 9,600 flowers.

LÆLIA MAJALIS.—That fine orchid, the most beautiful of all lælias, *L. majalis*, has just bloomed here, and indeed no words can overpraise its beauty. This plant is found very hard to flower in most collections, but I think probably, in many instances, the failure to flower it arises from the failure to procure a strong plant to start with. No trouble at all was experienced in the flowering of the plant in the collection here. Its main requisites are: First, perfectly clean potting material, which should be peat only. It may be top-dressed neatly with living sphagnum moss, which greatly improves its appearance. Secondly, plenty of light, but no sun; water only enough in winter to keep bulbs plump and a night temperature of about 45° to 50° during winter, increasing to 55° during the early spring. Day temperature 10° to 15° higher. As growth advances, increase water supply, and once in ten days give the plant liquid manure, as a strong growth is imperative to the production of a

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flower. It flowers with the young growth; and those who follow treatment given will be rewarded with a flower when once seen is not soon forgotten. Its beautiful lilac-rose petals and sepals, and its beautiful three-lobed lip, white inside, striped magenta-purple, will be a source of great pleasure to behold. The plant here was grown (as it always should be) in a basket suspended about a foot from the glass.

Rahway, N. J. A. P.

LANDSCAPE PLANTING.—One of the leading points in the skill of a landscape gardener,

GROUNDS OF JAMES M. ELWELL, BROOKLYN, N. Y.

is to plant so that the area of the grounds will appear larger than it is. It is a rare art, for in many plots supposed to be well laid out, as the term is, the result is to contract rather than to enlarge the apparent space. An illustration of the correct idea of planting appears in a photograph before us, of a scene in the garden of Mr. James Ellwell, now deceased, of Brooklyn, N. Y. It is very difficult to apply this great principle in landscape gardening on a small suburban plot, or (we might almost say) a city yard. It would be impossible, in this case, to conceal the boundary fence, and perhaps unwise to do so, even though possible,—but the method of planting on these grounds seems to throw that boundary farther away than it really is. It is a pleasure to commend these illustrations of landscape gardening as the fine art it should really be.

BIRCH TREE BORER.—A correspondent says that birch trees all over the country are dying, even trees fifty years old seem to die in a few weeks during summer. He sends a sample of the leaves that are turning yellow to note what is the matter. Nothing was found the matter with the leaves, but if the correspondent had thought to split the twigs he would have found them but shells, a boring maggot having cleaned out the whole centre. If the whole tree is perforated in that way, even fifty years of age could not save it.

HONEY APHIS.—The large honey aphis has been unusually abundant this year, and has afforded the newspaper reporters in Chicago, and other large cities, the opportunity of getting off smart paragraphs about a "new and wonderful bug." The honey aphis really is not so serious an enemy as its smaller relatives, as it sucks from the bark, and not from the veins of young leaves,—but they have a disgusting appearance on the branches of the trees.

HARDY EVERGREENS.—When in search of evergreens particularly hardy and yet very choice, do not overlook the Colorado Blue Spruce. This native inhabitant of the Rocky Mountains endures the very coldest temperatures, and when well established will make one of the prettiest decorative evergreens, in color and form, that can be desired. It grows just rapidly enough to avoid an unnatural compactness, yet always maintains a regular, symmetrical growth that makes it prominent among other evergreens. Seedlings yield a great variation in color, from a light green to a bright steel-blue. Grafted specimens, secured from trees of the best color, are the best to obtain. The arbor-vitæ is a commoner tree, though the many varieties offer ample room for choice of pretty and desirable kinds. But it is perfectly hardy and thrives almost anywhere except in shade.

ALPINE PLANTS.—Plants have a great power of adaptation to circumstances and surroundings; and especially seem to make an effort to produce seeds. I have seen a morning-glory seed, planted late in the season, making haste to bloom while low on the ground; and the same, in early spring, would make a luxurious growth of vines and leaves before a single blossom appeared. Dear Mrs. Howitt wrote:—

"God might have made the earth bring forth
Enough for great and small,
The oak tree and the cedar tree,
Without a flower at all."

San Diego, Cal. MRS. E. E. ORCUTT.

FUCHSIA CULTURE.—The fuchsia is one of the most beautiful of pot plants for flowering all summer, but in most part of our territory it is only successful when the pots are placed in partial shade.

PARIS STREET TREES.—Wide streets and handsome street trees help largely in the fame of beautiful Paris. But the success of the trees is due to intelligent oversight by the authorities. Even with this admirable protection, the average life of a Paris street tree is found to be but half that of those growing in the environs. Of varieties, the following have been found best suited to the conditions of Paris, preference being given in the order named:—Horse-chestnut (which is much the best), plane, ailantus, locust, linden, and paulownia.

GROWTH OF LANDSCAPE GARDENING.—Landscape gardening in this country is yet largely in its infancy, and just as the human infant is taught to acquire its knowledge step by step, so must the people be taught, step by step, the fundamental principles of the question involved. To appreciate any profession and improve thereon, we must first learn the foundation on which it is built, for if familiarity with the foundation is lacking, the building of the necessary knowledge is at least faulty and laborious.

Landscape gardening is an art—not necessarily a study only. It matters little how much a person may know about trees and flowers, their growth, foliage and habits, if he have not the appreciation for a purely natural piece of landscape, nor the feeling and instinct to construct similar effects, he can never hope to be successful in the higher art of landscape gardening. Do not infer by this that study and knowledge of the character of plants are not necessary,—far from it,—for without this knowledge the construction of a pretty landscape would be impossible, as one of the most important things is that we must picture in our minds what the effect will be,—not this year, or the next, but when the trees shall have eventually come to maturity. This would of necessity be impossible without a thorough knowledge of every plant and tree used.

It cannot be too strongly emphasized that landscape gardening is an art, and, like all other arts, a talent which must be exercised,—not buried,—to be brought to its highest state of perfection.

What is the object of landscape gardening? You may infer from what has been said that it may be practised only in the country, where unlimited space abounds, therefore, what can it mean to those who may be within the limits of a large city, or who simply own an acre or two?

In these days of progression, man stops at nothing. He has caged the lightning of the clouds and brought it to our cities for light and

flower. It flowers with the young growth; and those who follow treatment given will be rewarded with a flower when once seen is not soon forgotten. Its beautiful lilac-rose petals and sepals, and its beautiful three-lobed lip, white inside, striped magenta-purple, will be a source of great pleasure to behold. The plant here was grown (as it always should be) in a basket suspended about a foot from the glass.

Rahway, N. J. A. P.

LANDSCAPE PLANTING.—One of the leading points in the skill of a landscape gardener,

GROUNDS OF JAMES M. ELWELL, BROOKLYN, N. Y.

is to plant so that the area of the grounds will appear larger than it is. It is a rare art, for in many plots supposed to be well laid out, as the term is, the result is to contract rather than to enlarge the apparent space. An illustration of the correct idea of planting appears in a photograph before us, of a scene in the garden of Mr. James Ellwell, now deceased, of Brooklyn, N. Y. It is very difficult to apply this great principle in landscape gardening on a small suburban plot, or (we might almost say) a city yard. It would be impossible, in this case, to conceal the boundary fence, and perhaps unwise to do so, even though possible,—but the method of planting on these grounds seems to throw that boundary farther away than it really is. It is a pleasure to commend these illustrations of landscape gardening as the fine art it should really be.

BIRCH TREE BORER.—A correspondent says that birch trees all over the country are dying, even trees fifty years old seem to die in a few weeks during summer. He sends a sample of the leaves that are turning yellow to note what is the matter. Nothing was found the matter with the leaves, but if the correspondent had thought to split the twigs he would have found them but shells, a boring maggot having cleaned out the whole centre. If the whole tree is perforated in that way, even fifty years of age could not save it.

HONEY APHIS.—The large honey aphis has been unusually abundant this year, and has afforded the newspaper reporters in Chicago, and other large cities, the opportunity of getting off smart paragraphs about a "new and wonderful bug." The honey aphis really is not so serious an enemy as its smaller relatives, as it sucks from the bark, and not from the veins of young leaves,—but they have a disgusting appearance on the branches of the trees.

HARDY EVERGREENS.—When in search of evergreens particularly hardy and yet very choice, do not overlook the Colorado Blue Spruce. This native inhabitant of the Rocky Mountains endures the very coldest temperatures, and when well established will make one of the prettiest decorative evergreens, in color and form, that can be desired. It grows just rapidly enough to avoid an unnatural compactness, yet always maintains a regular, symmetrical growth that makes it prominent among other evergreens. Seedlings yield a great variation in color, from a light green to a bright steel-blue. Grafted specimens, secured from trees of the best color, are the best to obtain. The arbor-vitæ is a commoner tree, though the many varieties offer ample room for choice of pretty and desirable kinds. But it is perfectly hardy and thrives almost anywhere except in shade.

ALPINE PLANTS.—Plants have a great power of adaptation to circumstances and surroundings; and especially seem to make an effort to produce seeds. I have seen a morning-glory seed, planted late in the season, making haste to bloom while low on the ground; and the same, in early spring, would make a luxurious growth of vines and leaves before a single blossom appeared. Dear Mrs. Howitt wrote:—

"God might have made the earth bring forth
Enough for great and small,
The oak tree and the cedar tree,
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INTENTIONAL SECOND EXPOSURE

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We may say, therefore, that the practical way to gain appreciation of the beauties of Nature, is to open up the natural gems so that they may be approached with comfort and please the eye. J. F. M.,

Before the Penna. Hort. Soc'y.

THE BEST DECORATIVE PALMS.—Of palms used for massing in decorations, none are

SYRINGA VILLOSA. (SEE PAGE 121)

landscape gardening mean the reproduction of Nature's work wherever possible.

If we take a stroll along the lovely drives and walks of the famous Fairmount Park, Philadelphia, and especially by the Wissahickon, we can get no more forcible illustration of this thought.

It is to be doubted very much if before the land for this park was taken, there were more than a few hundred persons in Philadelphia who really supposed there was at command such a wealth of Nature's most costly gifts. But the land was condemned, and in course of better, where tall ones are required, than the *Areca* and *Kentia*. They grow rapidly, and run up more slender than others, yet are quite graceful. Professional decorators admit this, and say further that the *Phoenix rupicola* is the most satisfactory where the plant is to be brought into frequent use. It stands handling much better. But it is not quite so pretty as the others. For single specimens, the *Latania* and *Livistona rotundifolia* are very desirable. Small plants of the graceful *Cocos Weddeliana* are always admired, and may be used in the foreground of a bank of palms.

NEW OR RARE PLANTS.

FLOWERING OF THE EREMURUS.—We have, in Hartford, a great many fine gardens, owned by friends of yours. One of the loveliest I have had the fortune to be in is that of Mr. N. F. Peck, at 31 Niles Street, where, this week, a grand flower was in bloom, such as has not been seen here, nor have I heard of otherwise, except in catalogues. It was the *Eremurus Himalaicus*, a tall lily from Turkestan and the Himalaya Mountains of India. A shaft of at least six feet bore, at its terminal, closely set flowers the size of a silver half dollar, with long stamens and anthers, very unique in appearance.

It must be a great pleasure to watch and note the gradual growth and bloom of such rare specimens by its owners, as we all know in a less degree of our own experience, from the interesting development of favorite new acquisitions in our gardens. Of other magnificent features seen in that garden, I must speak at some future time—such as the rare aquatics, the arbors and hedges of Crimson Rambler roses, and numerous other attractions.

Hartford, Conn. MRS. WILHEMINE SELIGER.

SYRINGA VILLOSA (see page 120).—Among hardy shrubs recently introduced to our gardens, one of the lilac family, *Syringa villosa*, commends itself by several meritorious features. The photograph is kindly presented by Mr. W. C. Egan, of Egandale, near Chicago. He well remarks "what a fine plant for a hedge where a space twelve feet wide could be devoted to it." The common lilac was a favorite with our grandmothers for forming an ornamental hedge,—and much of the pleasures of young city folk is in the prospective visit to some country garden, where the privilege can be enjoyed of plucking the lilac blossoms from some old farm-house lilac fence. The new species is a native of the north of China, and will no doubt prove hardy wherever the common lilac will grow.

THE HARDY FLOWER GARDEN.

CENTRANTHUS RUBER.—If not one of the showiest in flower, the Red Valerian, *Centranthus ruber*, is certainly one of the most desirable and interesting. Perennial plants that commence blooming in early summer and continue until late in the season, are not plentiful; but this answers that description, and is, besides, adaptable to poor soil and rockwork. In color, it is a dark red; the leaves a glossy green. The flowers individually are small, but are less insignificant than might be by being bunched. There is a white variety, also.

HARDY CACTUSES.—In rockwork, vases, on old walls, or near anything of a somewhat artificial character in gardening, few things are more effective than the hardy cactuses. Of the genus *Opuntia*, that class having broad, flat, thick "fronds," as the sections of the plant are usually termed, the one figured from

OPUNTIA RAFINESQUII.

Gardening Illustrated—Opuntia Rafinesquii—is the best known. It is the common hardy cactus of the Atlantic sea-board States, and is especially abundant in the sandy regions of New Jersey. In open sunny places it is a free bloomer, and the plants are almost hidden by the profusion of golden flowers. The blooming season lasts but about two weeks,—but the flowers attract wide attention while they last.

LESPEDEZA BICOLOR AND DESMODIUM PENDULIFLORUM.—In reference to the notes in the July issue, concerning *Desmodium* and *Lespedeza*, Mr. P. Ouwerkerk, Jersey City, N. J., points out the possibility of misunderstanding arising from the article named. It should be well known that there are two distinct plants, *Lespedeza bicolor* and *Desmodium penduliflorum*, and it is to be presumed that A. P. only had the one plant sent him under the two names. This conclusion may be readily reached from the fact that some nurserymen have had their plants wrongly labeled. Mr. Ouwerkerk says:—"The *Lespedeza* blooms

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more in the manner of the *Indigofera floribunda*, and is not as tender as the *Desmodium*, so that the branches often keep alive during a mild winter in Holland. The best use to make of the *Desmodium* is to plant it singly on a lawn, and tie the branches to a two-feet-long stake, above which the growth, three to four feet long, will droop, making the plant look like a large bouquet of purple-blue flowers. It is also very handsome planted on the borders between *Hydrangea paniculata grandiflora*, which blooms at the same time."

FRUITS AND VEGETABLES.

BUFFALO-BERRY—AN UNCOMMON FRUIT.—There are quite a few desirable fruits among our native plants, some of which are grown in considerable quantities in certain sections, but in the majority of places are totally neglected. One of these is the Buffalo-berry, *Shepherdia argentea*. It has the disadvantage of producing male and female flowers on different trees, so that several plants are needed to produce fruit, and one of these must be the male form. The fruit is well described in the report of the Minn. State Experiment Station, which says: "We have found the fruit to vary considerably in size, and also in the season of ripening, some of it being apparently ripe about the middle of August, and other trees producing fruit which would hold on into the winter. A peculiarity of this fruit is that frost seems to improve the quality of it much in the same way as frost affects the persimmon. The points which especially recommend this berry are its great hardiness, productiveness and reliability. The fruit makes an excellent sauce, and a jelly fully as good as currant. The plant is ornamental, and makes a pretty, dwarf hedge, standing pruning well."

GOOD CELERY.—It is surprising how large a proportion of market celery is of inferior quality. A first-class article has usually to be sought for in the garden of the amateur. Probably the reason given would be that the extra price required to pay for the extra labor in producing it, could rarely be obtained. The average buyer of celery does not know the difference between a good article and a poor one. When it comes to the table, it is not truly as bitter as gall,—but it is far too bitter for gastrical enjoyment. In the market garden, all sorts of schemes have to be followed to save labor in blanching the plant,—the art of removing the natural bitter quality. At times, the plants are set close together so as to partially shade one another, and finally boards are set up-right against the plant in the rows. At other times, albino varieties are employed, that seem blanched because they develop no green or chlorophyllous matter in their structure. But the bitter taste remains. A large proportion of celery that comes to table is untouched or wasted.

To have good celery, the process of earthing up must be continuous. It requires a very rich soil, and if plenty of water can be given, so much the better. If well managed, any variety can be brought to good results,—but, of course, there are varieties that give much more satisfaction than others.

LADY ELGIN STRAWBERRY. — Mr. S. L. Watkins, of Lotus, California, finds the Lady Elgin Strawberry early in that section, about as large as Sharpless in size, of a bright red color, and firm enough to endure shipping well.

FRUITING OF FIGS.—The Fig, *Ficus Carica*, has the male and female flowers on separate plants, just as the Osage Orange, Mulberry, and other plants of the same natural order have. The fruit, however, which is chiefly the enlarged and succulent calyxes of numerous flowers, reaches a considerable size, just as we see it in most gardens or places where a tree is growing alone. But when it has the advantage of pollen from the male trees, the fruit is very much larger and superior in every way. In the case of the fig of our gardens, the fleshy part we know as the fruit grows to a considerable size, and the seeds inside seem to perfect, but are incapable of germination, being but hollow shells. Where the fig is grown for drying, care is taken to have the advantage of pollinization, when they are much finer in every way than the ordinary garden fruit.

JAPANESE PLUMS IN PENNSYLVANIA.—The fruit growers of Southwestern Pennsylvania are unanimously agreed that the Japanese Plum is worthless for that section. The buds push

too early in the spring, and are almost always frozen, resulting in no crop. This is discouraging; yet there may be a way of locating the trees on northern slopes where the buds would be more backward and less liable to injury. In other sections they are a perfect success, and frequently bear to such an extreme as to produce under-sized fruit and break down the branches. Of course, this is not permitted by the careful fruit-grower, who thins his fruit, increasing the size of the remaining ones and improving the flavor. But for flavor the old European varieties still lead.

PEACH GROWING.—Georgia has become the paradise of the peach grower. There are a number of large companies engaged in the business. Fifteen of the larger ones have altogether nearly two million of acres in peach trees,—to say nothing of smaller affairs, and the orchards of individuals.

IMPROVED FRUITS.—In the endeavor to improve fruits, it must not be forgotten that nature only permits variation up to a certain line. We shall never see a pear as big as a pumpkin, or a strawberry as large as a well-grown tomato. Thus far thou shalt go and go no further, is as true of variations as of the waves of the sea. To improve the pear, it is little use to sow seed of the Seckel if a good spicy flavor is desired, or of the Pound Pear if we desire large size. We must select some variety that already lacks some one point of excellence and improve on that.

THE CRAWFORD PEACHES.—From time to time new varieties of peaches are introduced that seem to compete bravely with the older varieties,—and, indeed, most of the older ones have had to surrender their laurels to the new-comers. There are, however, two that yet brave nobly the battle with the new-comers, namely, the Crawford Early, and Crawford Late. Those who raise peach trees, on a large scale, say that the demand for these two well-tried kinds, is about as large as ever.

ONION CULTURE.—In the onion, we desire to grow large bulbs and not large leaves,—hence the ground should be manured and another crop taken from it before the onion is planted. Before the onion is planted, the earth should be made as fine as possible. This encourages bulb growth. Even under the most intelligent supervision, there will at times be a tendency to make strong leaves instead of bulbs. To check this tendency, the onion-grower bends down the leaf growth just above the bulb, though, of course, not bending the bunch enough to break the leaves off.

SEED SOWING.—It should not be forgotten, in sowing vegetable seeds, and, for the matter of that, all seeds, that they must have air, moisture, and darkness, in order to sprout properly. If sown deeper than they desire, they rot; if too shallow, the light is too intense, or they do not get moisture enough. As a rule, they should be as near the surface as possible, with the rather dry earth packed around them as firm as possible. The surface earth should be rather dry, or it will not powder well,—and this is important in connection with air. There is no air in a soil pressed when wet,—but the more dry earth is pressed and pounded, the finer and more porous it becomes. There is a great art in getting seed to grow properly—and yet the art is very simple when the principles are understood.

SALSIFY.—The natural order of compositæ furnishes a goodly number of vegetables. Of the root-class the Salsify is a useful member,—though from ignorance of its requirements in the garden, and of its preparation in the kitchen, it is not in use as generally as it deserves to be. Its name, Salsify, is of Spanish origin, which would indicate that it was in use in Spain before its introduction among English-speaking people. The name cited is all it seems to be known by in the Old World. In America, it has come to be known as Oyster Plant, from a fancied resemblance in flavor to the familiar Shell-fish of that name. As usually served in modern cookery, this peculiar flavor is hidden by the applied surroundings. It takes effort to detect any oyster flavor as commonly served.

To grow it properly so as to have the flesh tender, and true to its American name, a dry soil must be carefully avoided. Its preference with us is for a substantial, loamy and very rich soil, and the seed should be among the earliest sown, as soon as the ground is dry enough after the frosts have departed. When

growing, the plants should be thinned to at least six inches apart.

Cooking, one of the main elements in having on the table a first-class article, is a subject for another department,—but it may be stated here that, in the opinion of the writer, they need be not only boiled as parsnips are,—but the sections should be steeped in vinegar a few hours before being put on to boil.

Many persons enjoy it most chopped fine and made into fritters, as might be done with the true oysters.

TREES IN WET PLACES.—A correspondent who has been making an aquatic pond at Oberlin, Ohio, says :—"Last winter, on account of extreme cold and the encroachment of my water garden upon two fine, bearing apple and pear trees, they died. What ornamental trees could you recommend to replace them? Rapid growers and ornamental are desired. The *Liquidambar* grows with me."

The trees probably died from the backing up of the water, thus drowning the roots. Trees in swamps require air,—for while the main root goes down deep into the mud, the surface roots work among the moss at the top of the water. Where there is danger of the roots drowning, the rule is to plant above the surface. A bottomless barrel or box to hold the earth in which to plant has to be employed. Apples, pears, or anything will do well on swampy ground when so treated.

DIVIDING AND REPLANTING RHUBARB.—Large old roots of Rhubarb which have not been disturbed for years might with advantage be lifted, divided, and replanted. Secure several good crowns to each division, or divide a large clump into four. The spot selected for planting them must be well dug and heavily dressed with rich farmyard manure. Give a space of three feet between each division. Also mulch the surface with manure.—*Journal of Horticulture.*

FINE JAPANESE PERSIMMON.—A very fine specimen of the Japanese Persimmon, *Diospyros Kaki*, has been blooming for several years past on the grounds of the Friends' Meeting House, at Fourth and Green Streets, Philadelphia. It is estimated to be from 18 to 20 feet high, and the branches droop over the wall on the Green Street side. The persimmon family have many individual trees bi-sexual, though often isolated trees bear abundantly. This one has never been known to bear a fruit, but is very ornamental. It flowers later than the native persimmon. It was from a seed planted during the American Centennial.

CONCORD GRAPE IN PENNSYLVANIA.—According to reports made to the Pennsylvania State Horticultural Association, the Concord Grape yet leads all varieties in popularity. It has a flavor peculiarly its own; and when well-grown is exceedingly tempting.

THE BALDWIN APPLE.—From eastern orchards, the Baldwin holds a high place in the apple market. Though not of the highest flavor, it is above the average in this respect, and, as an all-round variety, it holds a high place on the fruit-grower's list.

YORK IMPERIAL APPLE.—One of the most famous Pennsylvania apples is York Imperial It is a winter apple, and an excellent keeper, making it a good market variety. It is of good size, irregular in outline, red on yellow ground rather concealed. Flesh yellowish, and very good eating.

FRUIT-GROWING IN CALIFORNIA.—The extent of the fruit-growing interest in California may be estimated from the fact that, at a recent convention in San José, no less than 800 active fruit growers were in attendance.

GRAVENSTEIN APPLE. — Mrs. Seliger says that Red Astrachan Apples are often labelled Gravenstein in the Hartford (Conn.) markets. The Red Astrachan is a Russian variety, and one of the best of its class, but will not compare with a Gravenstein in eating properties.

THE BEST NEW STRAWBERRIES FOR MICHIGAN. — The Michigan Agricultural Station says that the most promising of the newer strawberries are Excelsior, Flash, Lady Franklin, Nick Ohmer, Ponderosa, and Sample.

BISMARCK APPLE.—A fruit of the Bismarck Apple, grown by Mr. W. Turner, gardener to John Rockefeller, Tarrytown, New York, weighed fourteen ounces.

BIOGRAPHY AND LITERATURE.

YOUTHFUL DREAMS.

There is nothing can equal the tender hours,
  When life is first in bloom;
When the heart, like a bee in a wild of flowers,
  Finds everywhere perfume;
When the present is all, and it questions not
If those flowers shall pass away,
But, pleased with its own delightful lot,
  Dreams never of decay.—PERCIVAL.

DR. WM. BALDWIN.—In an early volume of MEEHANS' MONTHLY is given a brief note in reference to Dr. Baldwin, in which Dr. Gray is quoted as saying that only through his letters, as published by Dr. Darlington, very little would be known of him. He must have been an indefatigable collector aside from his high merits as an acute botanist. His specimens from the southern parts of our own territory and from South America, form one of the most valuable portions of the great herbarium of the Academy of Natural Sciences of Philadelphia. His last work was as surgeon and naturalist to Long's expedition to discover the sources of the Mississippi, and little is known of him in this connection than that he died on this trip at Franklin, Missouri, on September 1st, 1819.

The author of this paragraph has recently been looking among some botanical material covered by the dust of nearly a century. The plants of Lewis & Clark's expedition were discovered. Another interesting thing was the Journal of Dr. Baldwin. On reading, one cannot but be struck with the troubles and trials of an enthusiastic naturalist. Under date of July 7th, is the following entry :—

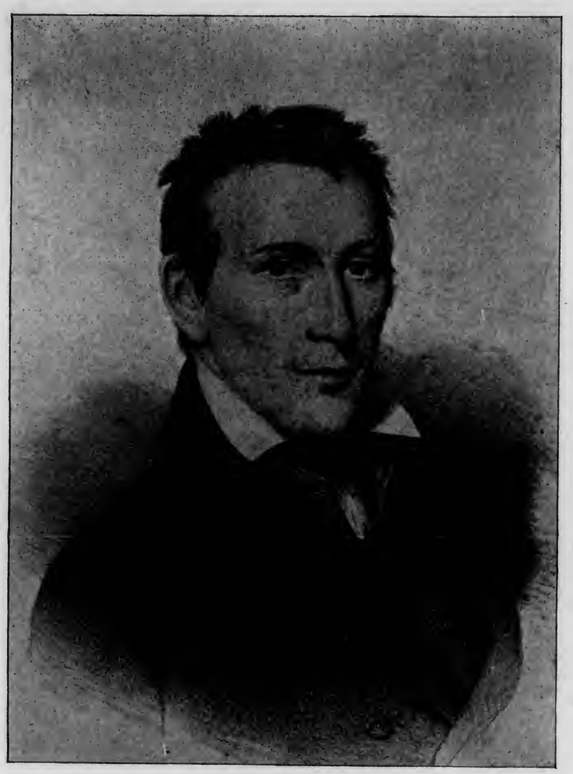
"July 7th. The mortification and chagrin in being thus disappointed from time to time in my expectations of doing anything worthy of notice in the expedition is inexpressible. Perhaps I do not support myself under it as I ought and may manifest a disposition too irritable, but when I reflect upon the period of life to which I have attained, the delicate state of health to which I am reduced, without the means of doing anything efficient (I fear) to restore it, the unfinished labors of eight years which would be almost entirely lost in case of my decease, and above all the rising family which looks to me for support, I cannot but feel conscious that those who best know me and my concerns will plead in my behalf. Still if I know the nature of my own heart, I bear no malice against any man, and if I have unjustly offended any one it has not been intentional. To that Being who, I have always believed, takes cognizance of the action of men, I humbly appeal for the truth of these observations. As for the others who make up the corps of naturalists, altho' they acknowledge their inability to do anything of importance, blessed with health and mostly in the vigor of youth, and pleased with travelling a great distance, they can restrain their feelings more, of course, than (without families) I can who have reached little beyond the sanguine romantic period of youth.

Had I received the slightest intimation that this preliminary expedition was merely to ascertain whether a steam-boat could ascend the Missouri, and that she would only stop to repair, surely no man in his senses would have embarked in her,—to waste his time in idleness, or in keeping a journal which can be of no real service. Under such circumstances all that can be entered in a journal with propriety must be derived from the transient glances we accidently have of seeing the shore in the immediate vicinity of the river, which must necessarily be very partial and defective."

On the 8th, one of the firemen had a cramp in the stomach, and it was thought proper to land,—so that the entries on the 9th and 10th are full of botanical information. On the 11th, however, they were on their way, and for that day is the following :—

"July 11th. Having completed repairs, moved again and came too late on the evening on the larboard side, opposite a steep bank up which I was hoisted, but it was too dark to find anything. It is a dark vegetable mould at least five feet in depth, judging from the perpendicular bank.

Though Mr. L. exultingly observed that now I had exactly that botanizing ground I wished, bottom and bluff—a high calcareous bluff commencing a little above, but not being accustomed to botanizing by candle light as he would hunt deer or fish, this fine botanizing ground was lost to me. A few hundred yards above and in full view was a good landing near the foot of the Bluff! ! ! I am weary of these disgusting remarks, but the absurdity of continuing this hazardous expedition in a boat, which he has avowed will not answer the purpose intended, is so extraordinary that I cannot avoid speaking of it. Is the object solely for the purpose of having to say that he has ascended the Missouri higher than any other in a steamboat? Admitting that she did by hard pushing reach the Council Bluff, how is she to return to explore the Mississippi, which is now the scheme? The time that can be spared from blustering is joyfully spent in reading novels."



DR. BALDWIN.

On the 19th, they got hold of a copy of the *Mississippi Intelligencer*, in which it would seem Long's indifference to science was criticized. "Atkins, Jessup and Smith arrived by land." He seems to have had more encouragement after this, and especially after reaching Franklin on the 4th of August. But the entries for the 5th and 6th ends the journal. He was probably left there sick, for history tells us that he died there some three weeks following, on September 1st.

From what we learn of the man's home affections, it must have been a sad death, separated from wife, family and friends, by thousands of miles,—all a sacrifice for the advancement of science. The portrait from the earlier volume is again reproduced, as it will have more interest in connection with this new-found journal.

THE WINTER ACONITE.—Our well-known friend, the Winter Aconite, *Eranthis hyemalis*, as it has been known for nearly a hundred years, is in trouble. A scientific paper, just issued, says that the name must be changed to an old one discovered in Hill's "British Herbal," given to it about 150 years ago. Before garden-lovers change the name, it would be well to await for searches among some other musty old volumes, when further discoveries may be made. However, *Eranthis* is now so widely spread through the world, in thousands of gardens, that the labors of a few dust-covered botanists to inaugurate a change could not succeed. When a nurseryman has spent considerable time in advertising a plant under a given name,—especially for a life-time,—it becomes as so much cash. To change the name is a financial loss. He cannot be expected to make the sacrifice merely because some botanist forgot to search Hill's "Herbal."

After all, it is the botanist who suffers by these attempted changes more than the horticulturist. The latter feels the impossibility of success, and does not follow the lead. The botanist changes his herbarium names one day, and again the next. It is a case of cutting the nose to spite the face.

THE PINKSTERBLOEM.—In the July MONTHLY, Mr. Geo. D. Hulst states the Dutch "Pinxterblossom" to be the *Azalea nudiflora*.

Allow me to say that the Dutch name is *Pinksterbloem*, and Dr. H. Bos of the Agricultural Institute, Wageningen, (Holland), in his "Biography of Plants," calls it the *Cardamine pratensis*.

H. J. VAN ANKUM.

Riverside, Conn.

Writing of the spring glory of New England woods, Mrs. Seliger, of Hartford, Connecticut, observes:—"Have you ever seen the glories of our New England woods when the pink azalea or honey-suckle is in bloom? It is worth going far to see, and the impressions of this sight will never fade from memory. I do not concur with the idea advanced that the *white* swamp honey-suckle, of which your June number brings such a beautiful picture, is the Pinxter-flower of the early Dutch settlers. To the contrary, it blooms too late to be available for the festival of *Pfingsten* or Pinxters, as the low Dutch people called it.

We have first in the reign the lovely little *Rhodora*, of purplish pink. It blooms when all the surrounding woods are yet bare of foliage.

The second to come of this class is the pink azalea or honey-suckle. Its stems are not in leaf when the flowers appear; but the woods are green, though not in full foliage which surround the lovely pink flowers generally in the middle to the end of May. I have yet a big jardinier full of them in my room this day, June 8th, and *Pfingsten*, or Whitsunday, has been more than a week ago.

The white swamp honey-suckle comes out in July, often lasts into August, when the foliage of its deep green shrubs is a glazed resemblance to evergreen leaves of the laurel. Our Dr. Russell, here, the oldest Park Commissioner and your friend, who passed his youth "Up Neck," as our North End, with its Ten-mile woods is called, would be the best authority in this matter from personal recollections. Will you try to gain that gentleman's opinion in this matter? It would be very valuable for future historical references."

The criticisms on the claims of the two species of azalea to the designation of Pinxterbloom, are welcome. It may seem a small matter to some, but many of the serious blunders in history come from indifference to accuracy in these small matters. It is from the small acorn that the great oak grows.

In regard to the great wood honey-suckle, *Azalea nudiflora*, the writer has noted the brilliancy of the flowers where the plants are growing in high altitudes, in rocky places, where, in the language of modern authors, there is a greater struggle for life. But this fact has been reduced to a general proposition by the writer, that brilliant coloring and this "struggle" are always coincident.

KNOWLEDGE.—London, edited by Richard & Proctor.—This English magazine is devoted to the spread of exact knowledge in popular language, and carries out well these good objects. Every branch of knowledge receives attention. During the few past issues have appeared a series of chapters on plants and their food, which, though strictly scientific, render the subject so plain as to be well understood by every lover of plants. The author, Prof. H. H. Pearson, shows that, though much is now known about the economy of vegetable life, much has yet to be discovered. There is still an unexplored field for the original investigator.

BOTANICAL NOMENCLATURE.—Our botanical works are praying for some new Adam to arrive who will give names to flowers that everyone will recognize. In regard to the scientific names, they thought they had it "down fine" when, in the time of Linnæus, they established a set of canons which every orthodox botanist, it was supposed, would obey. After a century of trial, it was found the laws agreed upon had not been observed. There has become a revolt, and a sort of go-as-you-please practice is prevailing. One author issues a book with one set of names, another a book with a different set for the same plants.—*New York Independent*.

GENERAL NOTES.

CRIMSON RAMBLER ROSE. — A Rochester, New York, correspondent says that some of the original plants introduced, of the Crimson Rambler Rose, on the grounds of Mr. Geo. Ellwanger, of Ellwanger & Barry, have formed one of the most brilliant of floral spectacles the past season.

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JUVENILE REFORMATORIES.—A correspondent of the Hartford *Times* does not like our modern juvenile reformatories. Children often become criminals because they have no outlet for doing what they like and what is proper for them to do. All children love to work in gardens; and if there were public gardens where children could voluntarily work if they wanted to, there would be no occasion to fill the reformatories to half their present extent.

None know better than those who have interested themselves in reformatories what are their weak points. However well treated, the inmates feel as prisoners, and there is the difficulty of placing them for a start in the world when the reformatory term expires,—a difficulty growing more serious every day. Aside from this is the enormous tax on the community in the way of private benevolence or public charges. None would welcome an improved method of lessening these pressures more than reformatory managers. Public gardens, as suggested, would help to some extent, —but they have not been found practicable in large cities from whence most of the population of the reformatories come.

——

LARGE DECIDUOUS CYPRESS.—The great Deciduous Cypress in Bartram Garden Park, at Philadelphia, now in decadence, reached a girth of 23 feet, about three feet from the ground. This has been regarded as a remarkable size. At a recent meeting of the Linnæan Society of London, the Hon. C. Ellis exhibited photographs of a *Taxodium distichum*, growing at Oaxaca, in Mexico, and of another gigantic tree, a native of Cambodia. The circumference of the former, at a height of three feet from the ground, was stated to be 143 feet, while the height was estimated to be not more than 100 feet. The native name for this tree is Sabino.

In relation to the early decadence of the celebrated specimen of Bartram's, it may be noted that one of the difficulties in the way of the much desired preservation of fine trees by taking the ground for public parks comes from the inability of city officials to know how to care for them. In Philadelphia, these parks are placed in the care of the Department of City Property,—a bureau established originally for the renting of wharves and market-houses, which cannot be expected to know much about the care of trees. With intelligent care, the Bartram Cypress could have been kept in good condition for another hundred years.

——

ORCHID FIBRE.—Orchids are famous for beauty and general attractiveness; but it is not generally known that they have a place in the arts that minister to the physical wants of man. But in some parts of the tropics, where orchids abound, a very delicate fibre is prepared by the natives, which they use in the preparation of the many ornaments these races prepare for trade with the paler races of men.

——

LAWS AGAINST WEEDS AND INSECTS.— For all the ineffectual efforts to keep out insects, fungi and weeds by law have been so freely shown to be supreme folly, Canada, as our readers know, prohibited the importation from the United States of nursery products in order to get immunity from the San Jose scale. At the time, MEEHANS' MONTHLY invited a smile at the law. These pests have numerous paths of travel without going through custom house gates, and it was predicted the San Jose scale would soon show itself to our friends over the border. Dr. Fletcher, a Canadian entomologist, has stated recently, that the San Jose scale has become the most serious pest that has ever occurred in Canadian orchards. But the law is still left as a scarecrow to the scale that is laughing literally "behind its back."

ANODA LAVATEROIDES

COLOR PLATE

ANODA LAVATEROIDES.

TREE-MALLOW ANODA.

NATURAL ORDER, MALVACEÆ.

ANODA LAVATEROIDES, Medic.—Lowest leaves cordate and usually angulate; upper deltoid or hastate or subtrilobate, the margins either irregularly dentate or entire; petals commonly cuneiform or retuse, from a third to nearly an inch long; carpels 15 to 20, rather conspicuously beaked, the dorso-basal portion wholly thin, scarious and veinless and with slender midnerve, the sides or partitions wholly obliterated in the breaking up of the fruit; seed naked, puberulent. See Robinson's *Revision of Malvaceæ* in Gray's *Synoptical Flora of North America*.

This very pretty representative of the beautiful order of *Malvaceæ* has been before us for many years under other names. Though described under the name of *Anoda lavateroides*, by Dr. Frederick Casimer Medicus, in a monograph of *Malvaceæ*, published at Mannheim, in Germany, in 1787, it was supposed to be identical with a Mexican species, *Anoda hastata* of Cavanilles. When Dr. Gray issued his famous illustrations of the genera of American plants, he took this species for drawings of *Anoda*, supposing it was *A. hastata*, and it is described as *Anoda hastata* in Dr. Gray's account of Wright's Texan plants —*Plantæ Wrightiana*. It has continued to be so regarded, until the appearance in 1897, of the work from which the description is taken, wherein Dr. Robinson places it in its true position as *Anoda lavateroides*. *Anoda hastata* has not been found within the territory of the United States, but is confined to Mexico, and has spread itself widely, even being common now in Jamaica; but from some unknown circumstance it has not been able to wander as far northwardly as its companion at home has, —the species we are now illustrating. It is a much more handsome species than the one with which it has been confounded. The flowers are larger, more roseate, and does not present such a poverty-stricken aspect in its foliage as the other does. The resemblance to *Lavatera*,—the Tree Mallow—which suggested the name *lavateroides* refers to the flowers only,—the rosy-pink petals with the darker veins are strikingly like those of the Mallow. When we come to the foliage, the resemblance is lost.

In giving the mere descriptions of the species, the student will often be at a loss to identify his plant in cases where the genus is divided into sections as in the present instance. The advantage of this method of treatment is that it saves numerous repetitions of characters, that may be common to the whole group. In the present case, for instance, Dr. Robinson divides the eight North American species into three grand sections, *Evanoda*, *Sidanoda* and *Cleistanoda*, our plant being classed in the former. We should, therefore, have to add to its distinctive character, that its "seeds should be horizontal, destitute of accessory coating,—capsule much depressed and radiatiform, of 9 to 12 dorsally beaked or cuspidate (rarely pointless) carpels, the flat summit hirsate or hispid. Calyx-lobes triangular or obovate, acute or acuminate; leaves very diverse in the same species." To save still further repetition, sub-sections are instituted, and in this smaller group our plant would have to be with "corolla violet or purple varying to white; calyx widely spreading under and mostly surpassing the hispid fruits, herbage destitute, or nearly so, of stellular pubescence but variably hirsute—hispid or hispidulous with usually simple bristly hairs, or else glabrate; slender peduncles nearly all subtended by leaves." It was worth while to give this description of the plant in full in order to show how faithfully the artist has followed the model before him. The simple bristly hair instead of the branched hair common to other groups, and which some flower painters would regard as unimportant, are beautifully presented. Seldom, indeed, even in our own

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COLOR PLATE
INTENTIONAL SECOND EXPOSURE

work, has the life history of the plant been condensed into a single view as here presented. By cutting the stalk in two pieces and giving both on the page, we have the bud with a glimpse of the colored corolla peeping through the opening calyx,—then we have the flower fully expanded, a facsimile of the Tree-Mallow for which it has been named. A flower just closing its light purple corolla is then seen, and one older with a darker tint on the same road, and we note the next in succession wherein the petals have wholly withered away, and the spreading hispidulous calyx is represented ; and finally, the seedvessel on the road to maturity. Even the character it possesses, of occasionally presenting us with a second flower in the axil of the other, is faithfully portrayed.

Our plant has been long known to botanists, even before the binomial system was introduced by Linnæus. It was at that time regarded as an *Abutilon*, and is referred to by Dr. Dillenius in his *Hortus Elthamensis*, in 1732, as the abutilon with crested fruit, and flowers like the Tree-mallow, this suggesting the name *lavateroides* to Medicus in modern times. Linnæus took it from *Abutilon* and referred it to *Sida*. When, however, Cavanilles established it as a separate genus, under the name of *Anoda*, he seems to have had in mind its relationship to *Abutilon*, for *Anoda* is said to be one of the names by which the East Indians know this plant, the derivation of both of which and *Sida* included is unknown. At one time it was supposed the name *Anoda* was of Latin origin, and signified "without a knot," for the reason that, while many closely related plants of the order had a knot or joint in the flower stem, the plants of this genus had none. They seem, however, to have the elements of such a character that might have been merely suppressed, for the sharp genuflection seen in the lowermost peduncle of the illustration indicates a weakness at that point. Though *Anoda lavateroides* claims a place among the native flowers of the United States, it is probable that it, like our native Indians, is not among its original inhabitants, but traveled northwardly from Mexico, where other species and species of its allied genera, *Abutilon* and *Sida*, abound. This and some half a dozen species are only found a little beyond the Mexican border line in Texas, Arizona, and New Mexico. It seems to have been first discovered by Wright, in Texas, and is described by Gray in the *Plantæ Wrightiana*. He gathered it near the copper mines in Mountain Valley, and near Santa Cruz in Sonora. It is variable in its general characters as are so many of the family, and a form with smaller flowers, but supposed to be the same species, was collected in the valley of the Chiricahua. It was subsequently collected by Riddell in Texas. In various places in Texas to Arizona, it has since been collected, but it does not seem to have been found in any great abundance anywhere in our territory. Crossing into Mexico it has a wide range going southwardly to Peru, and as already noted, has found a home in the Islands of the Caribbean Sea. That it has not spread more rapidly to the north is probably owing to the fact that the seeds have no special means of distribution. Its progress, therefore, must necessarily be very slow. The heavy seeds cannot go far beyond the point where they mature. In the case of many plants, birds aid in the distribution by carrying away dry fragments of the plants for nest building,—and in other ways portions with seeds are carried short distances. Even the winds will at times aid in scattering the broken branches, and birds will often carry small portions with seeds in their plumage. But our plant has tough, stringy fibre, similar to the fibre of hemp, and not even when dry can fragments be readily broken. The whole plant has to go if the seeds are to be dispersed otherwise than by the hand of man. If by any happy chance the seeds get an opportunity for distant carriage, it has another difficulty to surmount in its late flowering. The plant has to grow for several months before it reaches the flowering stage, and the few plants that get a foot-hold away from their seed's original home, have to run the risk of being eaten by herbivorous creatures, or destroyed in some manner before the flowers appear.

Our drawing was taken from a specimen kindly furnished by Mr. Jackson Dawson, of the Arnold Arboretum, at Boston, and presumably from Texan seeds.

EXPLANATION OF THE PLATE.—A branch divided into two sections, showing the flowers and capsules in various stages of development, and the halberd-shaped upper leaves which is a leading characteristic of the species,

WILD FLOWERS AND NATURE.

THE HERMIT THRUSH

"Hermit-thrush : 'tis sweet to be
Out in the summer woods with thee—
Far in their depths, so green and still,
That with thy tender music thrill,
Where a golden light through the maple gleams
In many tinted emerald streams,
And naught is heard but the trembling gush
Of thy greenwood music, hermit-thrush."

HOWARD WORCESTER GILBERT.

FLOW OF SAP IN SPRING.—It is well known that if trees of many species have the bark injured in spring, the branch will "bleed" as the running out of the sap is technically termed. An exchange says, "Before a meeting of the Biographical Society of Washington, Mr. W. A. Orton described the result of experiments made to determine the cause of flow of Maple sap in early spring. His conclusion was that the flow has a mechanical cause, being due to the increasing heat which expands the gases in the wood cells, and thus forcibly expels the sap. This contradicts the view that the flow of sap is due only to physiological action in the plant."

It does not seem clear how "heat" can be generated so as to produce such an effect. Mr. Wheeler's papers in this magazine on the flowing of the sugar maple sap seem nearer the mark.

FRUITING OF THE SKUNK-CABBAGE.—There are specialists among students of nature as in any other science or profession, and they no doubt derive from their observations a great deal of pleasure. But it is the lover of all nature who is constantly exhilarated and finds pleasure and opportunities for study on every hand—in the woods and fields, leafy or bare ; the birds, beasts and insects, in their actions and varied occupations, all have an indescribable and never ending charm.

One of these rare lovers of general nature, and an entertaining describer of his rambles, is E. Newlin Williams, whose pen frequently furnished notes for the readers of the MONTHLY. In an address made by him several years ago, in which was shown the extent of possibilities in general observations of nature covering almost every month of the year, the following remarks show interest attached to the common skunk-cabbage :

"The earliest flower to bloom is one of the latest to ripen its product,—Swamp-cabbage. I mean, which attracts the buzzing atomies in February by its heroic odor. The fruit is as large as a fair sized potato. It declines, seeming to hide through the summer months, and is often buried in the fall freshets which wash silt over the place where it lies, and there it ripens late in autumn. The seeds are starchy globules half an inch in diameter, somewhat flat, and striped or spotted with red-brown and green as though in reminiscence (or prophecy) of the tints of its spathe of February. They lie imbedded in the tasteless, glistening, mealy, white pulp of the fruit. I came upon these strange seeds while scooping out a drinking place in a clog of leaves along a wood stream. I noticed the hard globules in the handfuls of soil and humus ; I lifted and picked some out to identify. They baffled me and all other guessers until one day I carelessly cut one open, when it at once revealed its identity by the odor it exhaled."

A LESSON FROM CHERRY STEMS.—There are short-stem cherries and there are cherries with long stems. Everybody knows that. But who would suppose such a trifle had much relation to the general character of the tree? Well, attention was called, during cherry-blossom time the past spring, to a number of the garden cherry that had become wild years ago, by birds having sown the seeds. They had become fine, fifty-year-old trees in our native wilds. One of them seemed to be covered with green leaves without a blossom, while the others were white with blossoms as with the driven snow. A close examination showed that there were about as many leaves on all

the trees, but the leaves on the white-looking trees had been overshadowed by the long-stemmed white flowers, while the short-stemmed ones were hidden on the tree that seemed to be all green leaves.

ANODA LAVATEROIDES.—Referring to *Anoda lavateroides*, it may be noted that there is still another difficulty arises against the northwardly travels of some Mexican annuals that flower only after considerable growth has been made, that they are liable to be destroyed by foot before seeds have matured. Many early flowering Mexican annuals not handicapped in this manner reach high northern latitudes. The *Galinsoga parviflora* has spread itself over an immense area. But in its case a plant will flower in a few weeks after the seed has germinated, and often when but a pair of leaves have been fully formed. Taking it for granted, as modern botanists seem to believe, that species of plants have originated in comparatively local homes, and then advanced over larger areas by distributive agencies, the fact of *Anoda lavateroides* having so wide a distribution over our continent indicates a very ancient history, especially when we consider that the distributive agency of man must have been limited in the olden time.

POISONOUS RHUS.—The Tanners Sumac of the Old World, *Rhus Coriaria*, is said to raise blisters, and in other respects produce trouble similar to the poison *Rhus* of America, *Rhus Toxicodendron*. *La Semaine Horticole* believes that this reputation is simply borrowed from its American relative's behavior. But the truth is that the whole genus has been suspected of sometimes acting badly. Comparatively few, however, are susceptible. The *Toxicodendron*, commonly known as the Poison Vine, is the worst, but possibly not more than one in a hundred suffer who are brought into close acquaintance with it.

FERTILIZATION OF FLOWERS BY MOSQUITOES.—The mosquito feeds on the juices of flowers when animal food is absent. Mr. C. A. Crandall notes, in *The Plant World*, that in the Medicine Bow Mountains mosquitoes were caught carrying the pollimia of the green orchis, *Habenaria hyperborea*. Most orchids are unable to fertilize themselves without aid from outside sources. In this case the mosquito was rendering friendly aid in fertilization.

RHYTHMIC GROWTH.—Though it has long been suggested that growth in plants is not regular and continuous, but rhythmic, it is only within comparatively recent years that observations numerous enough to carry almost universal acceptance of the proposition have been made, and these chiefly through the labors of American biologists. But the European observers seem to conclude that this is not a natural rhythmic growth, but a condition induced by change from light to darkness, or some other phase of environment, which brings about this "periodicity," as they term it. In this light a paper contributed by M. E. Godlewski, to the Academy of Sciences, in Austria, is attracting marked attention in the Old World. His experiments show that there is more or less growth in proportion to the moisture or dryness in the atmosphere. He discovered that though a sudden change from obscurity to light brought about a diminution in the rate of growth, after five hours it would again resume its "normal" progress. The explanation from American botanists would be that the innate life energy is, naturally as all motion is necessarily, rhythmic; and that this energy is more or less feeble in proportion to external resistance. With partial rest, it acquires new force with which to oppose resistance, continuing till this is again spent.

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RHODODENDRON PUNCTATUM.—A correspondent says that the name by which the pretty *Rhododendron punctatum* is known, in some parts of North Carolina, is "May Laurel" or "Sweet Laurel,"—much more appropriate than common names often are.

GENERAL GARDENING.

THE FOUNTAIN ON MOUNT HELICON.

But the fountain
Where wells it? It has gathered in a marsh,
O'ergrown with rustling reeds and water lilies,
And bordered round with tamarisks and osiers,
The favorite haunt of painted flies and reptiles
That love the midday sun; and here I trace it,
Oozing through tall, rank grass and irises
From underneath a fallen arch. PERCIVAL.

HYDRANGEA PANICULATA GRANDIFLORA.—The variety of Japanese *Hydrangea paniculata*, known as *H. p. grandiflora*, is a rather coarse and heavy mass of flowers when examined closely, but it is a grand thing for effect from a little distance, and is among the indispensable ornaments in most grounds. It is also very useful for cutting purposes where heavy decorations are in order. In recent years, the faded flowers are cut and the bunches dried for winter ornaments. In garden work, plants have been trained to tall pillars and when in flower have a unique appearance. They are also being trained to single stems, and then have a peculiar effect with their drooping branchlets. In any manner grown, they are attractive. The specimen illustrated is a medium between the tree and ordinary bush form, and is growing on the grounds of Mrs. J. C. Keighler, at Priestford, Harford Co., Md. It is 15 feet in diameter, and about 12 feet high at the tallest point.

A LARGE HYDRANGEA.

PRUNING AT TRANSPLANTING.—It is common to note transplanted trees or shrubs with their strong leading shoots trimmed back, and a mass of weak branchlets left to form the tree. These vigorous leaders sho ld seldom be touched, but the weaker branchlets should be cut off. The ornamental planter might take a lesson from the practical fruit grower. A peach tree, for instance, has all its twiggy side branches cut away. Only a single stem like a walking cane is left. No planter of experience loses a transplanted peach tree.

ELM LEAF BEETLE.—For many years the elm trees on my lawn have been ravaged by the elm leaf beetle. Several years they have been entirely stripped of their leaves at this season, and a second crop of leaves has appeared after mid-summer.

This summer, for the first time, I have not observed either elm-leaf beetles or their larvæ on any of my elms. I can hardly think that this can be due entirely to my having sprayed the trees with London purple, for I have sprayed them in former years, but have never succeeded in ridding them entirely of the pest before. I should suppose that it was most probable that the beetles had met with some natural enemy. I should be glad to know whether my experience in this matter corresponds with that of others. F.

the trees, but the leaves on the white-looking trees had been overshadowed by the long-stemmed white flowers, while the short-stemmed ones were hidden on the tree that seemed to be all green leaves.

ANODA LAVATEROIDES.—Referring to *Anoda lavateroides*, it may be noted that there is still another difficulty arises against the northwardly travels of some Mexican annuals that flower only after considerable growth has been made, that they are liable to be destroyed by foot before seeds have matured. Many early flowering Mexican annuals not handicapped in this manner reach high northern latitudes. The *Galinsoga parviflora* has spread itself over an immense area. But in its case a plant will flower in a few weeks after the seed has germinated, and often when but a pair of leaves have been fully formed. Taking it for granted, as modern botanists seem to believe, that species of plants have originated in comparatively local homes, and then advanced over larger areas by distributive agencies, the fact of *Anoda lavateroides* having so wide a distribution over our continent indicates a very ancient history, especially when we consider that the distributive agency of man must have been limited in the olden time.

POISONOUS RHUS.—The Tanners Sumac of the Old World, *Rhus Coriaria*, is said to raise blisters, and in other respects produce trouble similar to the poison *Rhus* of America, *Rhus Toxicodendron*. *La Semaine Horticole* believes that this reputation is simply borrowed from its American relative's behavior. But the truth is that the whole genus has been suspected of sometimes acting badly. Comparatively few, however, are susceptible. The *Toxicodendron*, commonly known as the Poison Vine, is the worst, but possibly not more than one in a hundred suffer who are brought into close acquaintance with it.

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INTENTIONAL SECOND EXPOSURE

In this locality (Philadelphia) the elm leaf beetle has not been a serious trouble for several years past. This is attributed to the work of the English sparrow, which though a serious enemy to grain and other things, keeps down insects that are day-loving. For nocturnal creatures, such as the Tussock moth for instance, they are at rest while the moths are working, and can have no effect on them.

PIN OAKS IN FAIRMOUNT PARK, PHILADELPHIA.—One of the finest autumn scenes in America is the line of Pin Oaks along the concourse in Fairmount Park. The foliage has not the deep brilliancy of the scarlet oak,—but the deep orange red is scarcely less striking. The trees have been about twenty years planted, and were ordinary nursery trees at that time. Oaks in general, and the Pin Oak in particular, have come to be very popular with planters of late years. Previously, a notion prevailed that oaks were slow of growth, and difficult to transplant successfully. They have, however, been found to be as easy to transplant as other trees, and though not of extreme rapid growth, are fully equal to the average. They are more free from diseases and insects that give us trouble, though they do not wholly escape. (See illustration on opposite page.)

DRUG PLANTS.—Plants used as drugs, by the pharmacist, are usually wildlings. Already some are getting scarce in their native places, and prices rule high. The time is coming when dependence will have to be placed on the cultivator. As a guide to those plants for which there is a great demand, the following is extracted from the *American Druggist*, giving the report of a committee at the St. Louis meeting of the North Western Druggist Association. The prices are probably for the pound:

Blood—No doubt the high price of last year stimulated the gathering of large quantities of this drug, and prices have been lower; 1897, September, 7c; 1898, September, 5c to 5½c. Calamus, bleached—It is said the shrinkage of this root is very great, and prices are according to amount of moisture; selling now, 1898, September, from 28c to 35c. Ginseng—This is again high in price, selling, 1897, September, $2.50 to $3.25 per lb.; 1898, selling $3 to $4.25 per lb. Golden Seal—How much higher in price will this go? Some future year's report will tell you. We give selling prices as near as we can: 1897, October 1st, 32c; sales October 20th at 50c; November, 50c to 55c; December, 48c; 1898, January, 38c; February, 45c; March, 38c; April, 42c; May, 45c to 50c, June, 55c, and now, October 1st, selling 42c to 45c. So far, very little has come to hand this year. Ipecac—This has reached the highest figure in the memory of many of us, selling in 1897, October, $1.65; November, $1.75; 1898, January, $2; March, $1.90; May, $2.20; June, $2.35; September, $2.45 to $2.60. Lady Slipper—Another uncertainty as to price. See changes: 1897, October, 15c; November, 35c; December, 30c; 1898, March, 25c; April, 15c; now, October 1st, 17c. Very little gathered this year. Mayapple—Where this all is gathered is too much for your Committee to say; believed by some to amount to nearly two million pounds; prices have not been so high; selling, 1897, October, 4c; November, 7c; December, 6c; 1898, September, 4c.

Burdock is offering to arrive at 8c, but 9c is wanted for spot stocks.

Dandelion is firm at 9½c@10c for prime German.

Gentian is rather dull and the market is off a fraction; supplies of berry at 4c@4½c.

Golden Seal continues scarce and high and it is difficult to obtain any considerable quantity even at the advanced quotations of 47c@50c.

Ipecac is firm at $2.50@$2.60, with a fair amount of business going forward.

Jalap shows increased activity and prices have advanced to 12c@12½c. Spot stocks are pretty well concentrated and so far as can be learned only light shipments may be expected to arrive.

Sarsaparilla, Mexican, has advanced to 8c@8½c, with a brisk inquiry and limited supplies on hand. Quotations in our wholesale package prices should be corrected in accordance with above figures.

Serpentaria is in improved demand and firm at 21c@22c.

Senega has been marked up a fraction, the demand being brisk and supplies not overabundant; 25½c@26½c are the general quotations, though round lots might be had at 25c for spot cash.

GRASSES FOR LAWNS.—What is the best kind of grass to use for lawns, depends so much on the kind of soil, situation or conditions about it, that no definite answer can be given. On a tennis lawn, for instance, one of the first conditions should be that the kind selected should bear treading on. It is because of the uncertainties surrounding the whole

AVENUE IN FAIRMOUNT PARK, PHILADELPHIA, LINED WITH PIN OAKS. (SEE PAGE 134.)

question that gives popularity to mixed grass seeds for lawns. The one that finds itself most at home will eventually crowd out the rest. The misfortune is that, from these mixtures, the lawn is liable to have a spotted and patch-work appearance; where a lawn is to be desired of which the owner may be proud, there is no better way to secure it than by deciding what species is the best adapted to the soil and conditions desired, and then planting the pieces some inches apart so that before the year is over the pieces may run together. This plan is regarded as troublesome, and, indeed, is only successful when superior intelligence is employed to direct it, which is the reason, no doubt, why lawns constructed on this plan are seldom seen.

SCENE IN THE CATSKILL CEMETERY, CATSKILL, NEW YORK.—Nature and art are admirably blended in the picture on opposite page of a scene in the Catskill Rural Cemetery Association's grounds, at Catskill, New York. To make a perfect piece of landscape garden art, the artist only requires four leading elements—land, sky, trees and water. Here they are all combined. The road around the hill is in such close harmony with the contour of ground that it could not well be improved upon, while the water scene, with its lotus flowers in such profusion, might inspire the spirit of an Omar Khayyan. The strict critic might suggest that there are not trees enough to make all that might be desired,—but they are there in the young stage, and will give a good account of themselves in due time.

EVERGREENS FOR CHURCH AND HALL DECORATION.—The great variety of color in evergreens offers an excellent opportunity for utilizing them in decorations of various kinds. Every one knows what tasty beds of them can be arranged out of doors, but on the other hand very few think of what might be accomplished by their use inside. One of the prettiest foliage decorations the writer has ever seen, barring, perhaps, some where ferns were brought into use with fine effect, was a stage setting of these evergreens, ranging in size from little ones in 3-inch pots, used to bank in the foreground, edging off the whole, to large, bulky arbor-vitaes in 24-inch tubs. Contrary to what might be expected, there is nothing sombre about such an arrangement, if the taste of the decorator will bring into use a sufficient number of bright golden colors, and some with graceful foliage like the *Retinispora filifera*. Hemlock and Swedish and Irish Junipers are very useful. Other desirable kinds are the Chinese Arbor-vitæs, Variegated Box, Dwarf Box, Deodar Cedar, *Cephalotaxus*, Japanese Euonymus, Junipers, Retinisporas, and arbor-vitæs of all kinds and in many colors. They stand rough treatment better than the general class of plants used in decorations, especially as they may be taken out in cold weather without danger of freezing. A large, old-fashioned fire-place offers an excellent opportunity for decoration by means of evergreens. Of course, there can be no fire going.

NEW OR RARE PLANTS.

THE HANGED MAN.—There is an orchid called the "Hanged Man;" it is *Aceras anthropophora*, which is found nearly everywhere in France, on sandy ground or on lime stone; in Belgium in the lime-stone region of Florzé, near Aywaille, and in the sandy clay-stone region of Wemmel. It is easy to see why the *anthropophora* is called the "Hanged man" since it grotesquely resembles the figure of a man suspended by the neck. If you wish to see the resemblance for yourself, go to the localities mentioned, in May or June, and probably you will find, on the shady side of the woods, the "Hanged Man!"—From *La Semaine Horticole*.

EREMURUS HIMALAYACUS.—The illustration on page 139 represents a scene on the beautiful ground of Mr. W. C. Egan, of Egandale, near Chicago, Illinois. It is the more interesting as it also gives a portrait of a beautiful herbaceous plant from the Himalayan mountains in the East Indies, *Eremurus Himalayacus*. It belongs to the Liliaceous family, and is one of the most striking of the many striking things that appear occasionally among the lilies. The seed from which the plant was raised was sown in pots in 1896, and it pushed up its beautiful spike of creamy-white flowers in 1899, after reaching a height of six feet from the ground.

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AQUILEGIA FLABELLATA NANA.—One of the most desirable of recent introductions to our gardens is the Japanese dwarf Columbine, *Aquilegia flabellata nana*. Usually the species of columbine have such a family resemblance that the differences of the botanist can scarcely be appreciated. For garden purposes, one kind is about as good as another. In this case, the commonest observer is attracted by it. The somewhat leathery leaves have very broad, fan-like divisions, while the flowers have the petals very broad, and of an ivory white. The nectaries, so prominent in many species, are here very much reduced, and the flower stems are seldom over a foot high. It promises to be a popular favorite.

NELUMBIUMS IN CATSKILL RURAL CEMETERY. (SEE PAGE 136.)

HARDY HERBACEOUS PLANTS.—Hardy herbaceous plants are found much more essential in good gardening than they were a few years ago. Their helpfulness has been well illustrated at the Pan-American Exhibition at Buffalo. During the winter, Mr. Ulrich, in charge of the ornamental grounds, raised thousands from seeds. The plants were grown in pots and kept under frames; after midsummer these were planted where needed, and much of the beauty of these autumn months in these beautiful grounds has been due to Mr. Ulrich's foresight in making use of these herbaceous plants.

THE ROSE MILDEW.—"Referring to your excellent illustration of the Crimson Rambler in MEEHANS' MONTHLY just received, I desire to state that of the several illustrations that have appeared in the horticultural journals all plants have—when used for porch or building decoration—been planted at corners or detached pillars, where there is an open circulation of air. Several years ago I planted a large pot specimen imported from England, against the flat wall of a building having a southern exposure. Within a few feet to the east the building extended in the form of an L. In this wind-sheltered situation, the plant mildewed so badly that it became unsightly. It became as white as a miller's coat. I tried it there two seasons and then planted it at a post in the open, where it does not mildew. We are in a section where mildew is prevalent, and here, at least, this rose should be planted where there is a free circulation of air. *Rosa setigera*, even in the open, mildews more than any rose I grow."

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English Oak and other things, it seems probable that the white mildew on the rose is not frightened at any particular location. The immunity noticed by our correspondent was simply from the fact that the invisible spores of the fungus had not found a lodgment there.

These mildews and moulds have little terror now to the cultivator. Copper solutions in the early stage destroy the whole gang of depredators. Sprayers have now become as essential in a good garden as a hoe or a pruning knife.

PHLOX GLABERRIMA.—For all our many beautiful summer blooming herbaceous plants, our gardens would be badly off without representatives of the Phlox family. The many varieties of *Phlox paniculata*, as they have been improved by florists, are charming. But some of our native species, though they have not succeeded in securing the florist's attention, are scarcely less attractive. The smooth Phlox, *P. glaberrima*, is a good illustration. This shoots up abundantly from the ground, and makes a dwarf mass of rosy pink flowers from one to two feet high. The illustration on page 141 represents a plant as grown in the Arnold Arboretum, near Boston, Mass., which is under the intelligent care of Mr. Jackson Dawson, from a photograph furnished by Mr. A. Rehder.

FRUITS AND VEGETABLES.

VARIETIES OF APPLE FOR CIDER.—Mr. N. A. Whitney, a prominent maker of cider, of Franklin Grove, Ills., states that he uses Hews Va. Crab mostly in making the best cider—also the Romanite and Limbertwig. Almost any of the late fall and winter varieties may be used with the exception of such as Ben Davis, Willowtwig, Fameuse, etc.

CARE AND CULTIVATION OF ORCHARDS.—The following account, from the pen of a Maine commercial orchardist, gives valuable instruction applicable to small orchards as well :—

"My experience in orcharding dates from 1891, at which time I bought a field of about fifteen acres. There had been about two hundred apple-trees set out in one corner of this field ; but at the time of my purchase there were not over one hundred and twenty-five left, the others having been killed by borers and from other causes. These trees had been set out at least twenty years, and to my certain knowledge had never borne a profitable crop.

It may be well to state here that the soil of this field is a gravel loam, quite rocky, and with natural drainage. It was what would be called good corn land, and is well adapted, with proper cultivation, for fruit growing. Like many other New England fields, it had been given 'a slick and a promise,' until it was badly run out, and only cut, the year of my purchase, about five tons of hay.

My first effort to bring this orchard into something like a profitable condition was to give the trees a thorough trimming, followed by ploughing and planting potatoes, using two thousand five hundred pounds of Stockbridge Potato Manure on about three acres. Since then the orchard has been kept under the plough and harrow, with the exception of one year, when it was mowed, and the next year the grass was ploughed under.

From fifteen to twenty pounds, per tree, of Stockbridge Tree Manure has been applied broadcast every other year, and harrowed in, no other manure having been used.

The trees were sprayed once just as the buds were ready to open, again when the apples were about as large as beans, and again two or three weeks later with mixtures similar to Bowkers's 'Boxal,' 'Disparene,' and 'Bodo' mixtures.

The orchard has never failed to give a fair crop but one year, when the trees bloomed well, but were blighted by cold, wet weather.

Four or five furrows are ploughed each side of the rows, and these strips are kept thoroughly cultivated with a spring tooth cultivator, five to ten pounds of Stockbridge Tree Manure being applied every other year and cultivated in.

I had a few barrels of apples the past season from trees which have been set out seven years, and I have two hundred trees which have been set eight years the coming spring, that give promise of a fine crop.

We thus find that four things are essential to successful fruit growing,—namely, trimming, cultivating, spraying, and fertilizing.

Don't think that any thing will do to fertilize a fruit-tree. It won't. For some crops and under certain conditions there is nothing

superior to stable manure ; but it is not a properly balanced fertilizer for fruit-trees, being deficient in both phosphoric acid and potash, and is likely to grow wood rather than produce fruit. The fruit is likely to be deficient in color and flavor, and is liable to decay as soon as picked from the tree. With proper appliances the cost of spraying is nominal, and if properly done will add from twenty-five to fifty per cent. to the value of the crop.

For best results clean cultivation is necessary. It would be just as sensible to plant corn in grass land and expect to get a crop as to expect a fruit-tree to do its best under the same conditions. Do as much of the cultivating as possible with the harrow, and, when necessary to plough, plough shallow, so as to disturb the roots as little as possible. For young trees it will do nicely to plough a few furrows on each side of the rows and cultivate thoroughly.

EREMURUS HIMALAYACUS. (SEE PAGE 136.)

Do not neglect trimming for a number of years and then in a spasm of enterprise do a wholesale job. Trim moderately every year, and avoid cutting out large branches as much as possible.

A properly compounded, well-balanced commercial fertilizer will give a healthy growth, with plenty of fruit, of high color, fine flavor, and good keeping qualities. Such a fertilizer should analyze as follows : ammonia, three per cent. to four per cent. ; total phosphoric acid, fourteen per cent. ; potash (K^2O), ten per cent. to twelve per cent.

FERTILIZERS FOR FRUIT TREES.—But few amateurs know or realize the needs of fruit trees in regard to food. Mr. John A. Myers, of New York City, has made a number of translations from German works citing various experiments chiefly in connection with the use of nitrate of soda. From one of these the following hints are taken :—

"Stable manure and compost improve the mechanical condition of the soil and promote the growth, particularly of newly planted trees. They can, however, supply the demands for plant food only when applied every year in large quantities.

For older, well grown trees, the stable manure may be omitted, and artificial fertilizers are applied in their place.

Notwithstanding the demand for phosphoric acid seems small, it is not advisable to neglect its application, as the soil, and the yield and quality of the fruit are promoted by phosphoric acid.

The phosphate of lime, which at the same time contains considerable lime, has demonstrated its value for fruit trees, as has long since been known for the field crops. It is particularly important to liberally fertilize with phosphate and potash salts, at the planting out of orchards in fresh lands, in order to provide the soil with a reverse supply of fertilizer.

Where the object is to produce permanent effects, they are arrived at only by manuring with the three plant foods (potash, phosphoric acid and nitrogen) in combination. It is the business of the fruit raiser to judge of the proportions of the ingredients to be applied, according to the age and growth of the trees, for no recipe can be given which is everywhere applicable."

English Oak and other things, it seems probable that the white mildew on the rose is not frightened at any particular location. The immunity noticed by our correspondent was simply from the fact that the invisible spores of the fungus had not found a lodgment there.

These mildews and moulds have little terror now to the cultivator. Copper solutions in the early stage destroy the whole gang of depredators. Sprayers have now become as essential in a good garden as a hoe or a pruning knife.

PHLOX GLABERRIMA.—For all our many beautiful summer blooming herbaceous plants, our gardens would be badly off without representatives of the Phlox family. The many varieties of *Phlox paniculata*, as they have been improved by florists, are charming. But some of our native species, though they have not succeeded in securing the florist's attention, are scarcely less attractive. The smooth Phlox, *P. glaberrima*, is a good illustration. This shoots up abundantly from the ground, and makes a dwarf mass of rosy pink flowers from one to two feet high. The illustration on page 141 represents a plant as grown in the Arnold Arboretum, near Boston, Mass., which is under the intelligent care of Mr. Jackson Dawson, from a photograph furnished by Mr. A. Rehder.

FRUITS AND VEGETABLES.

VARIETIES OF APPLE FOR CIDER.—Mr. N. A. Whitney, a prominent maker of cider, of Franklin Grove, Ills., states that he uses Hews Va. Crab mostly in making the best cider—also the Romanite and Limbertwig. Almost any of the late fall and winter varieties may be used with the exception of such as Ben Davis, Willowtwig, Fameuse, etc.

CARE AND CULTIVATION OF ORCHARDS.—The following account, from the pen of a Maine commercial orchardist, gives valuable instruction applicable to small orchards as well :—

"My experience in orcharding dates from 1891, at which time I bought a field of about fifteen acres. There had been about two hundred apple-trees set out in one corner of this field ; but at the time of my purchase there were not over one hundred and twenty-five left, the others having been killed by borers and from other causes. These trees had been set out at least twenty years, and to my certain knowledge had never borne a profitable crop.

It may be well to state here that the soil of this field is a gravel loam, quite rocky, and with natural drainage. It was what would be called good corn land, and is well adapted, with proper cultivation, for fruit growing. Like many other New England fields, it had been given 'a slick and a promise,' until it was badly run out, and only cut, the year of my purchase, about five tons of hay.

My first effort to bring this orchard into something like a profitable condition was to give the trees a thorough trimming, followed by ploughing and planting potatoes, using two thousand five hundred pounds of Stockbridge Potato Manure on about three acres. Since then the orchard has been kept under the plough and harrow, with the exception of one year, when it was mowed, and the next year the grass was ploughed under.

From fifteen to twenty pounds, per tree, of Stockbridge Tree Manure has been applied broadcast every other year, and harrowed in, no other manure having been used.

The trees were sprayed once just as the buds were ready to open, again when the apples were about as large as beans, and again two or three weeks later with mixtures similar to Bowkers's 'Boxal,' 'Disparene,' and 'Bodo' mixtures.

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INTENTIONAL SECOND EXPOSURE

GATHERING WALNUTS.—Where walnut trees are on grass, invariably the best place, it is the rule, so soon as some fall, showing that the nuts are ripe, to send a man with a long stick up a ladder to beat the nuts off, gathering them up. They are usually then ready to part from the husk, but if not, letting them lie in a heap for two or three days to heat a very little produces the desired effect. The nuts should then be laid out thinly on shelves or a floor to dry, and afterwards stored in dry sand to keep fresh. The shop nuts are usually gathered before ripe, then heated to free the husks, and the flavor is in that way destroyed.—*Gardening Illustrated.*

METHOD OF STORING CELERY IN IOWA.—A writer in the *Minnesota Horticulturist* thus explains his method of storing celery:—"I dig a trench 18 inches wide, 12 feet long and 4 inches deeper than the height of the celery to be placed in it. Before killing frosts come, I take up the celery, place it in the trench in an upright position and close together. I cover with two boards 1 inch x 12 inches x 16 feet, until heavy snow and frost set in, then cover with a thick layer of stable manure. Other covering might answer."

CRANBERRY CULTURE.—"The wild cranberry (or craneberry) grew in natural bogs only. The best bogs are laurel, maple, cedar, tamarack, aspen, and balsam swamps. Cultivation consists in clearing away all growth except the vines and in sanding and preparing to flood. The bog is flooded to protect the fruit from frosts and to kill fire worms or other parasites. Among the latter are yellow-headed and black-headed fruit worms, which, if left unchecked, are liable to destroy the entire crop.

Growers remove weeds, add fertilizers, reflood from time to time and spray the vines to kill moths, larvæ, tip worms, scale, etc. Where suitable sand is available, all really first-class bogs are sanded regardless of whether or not they can be flooded. This renders cultivation and picking easier and makes the fruit brighter and cleaner.

In some sections, where flooding is not accomplished by natural freshets or the use of artificial dams and sluices, powerful pumping works have been erected. When the weather bureau reports an impending freeze, the pumps are put to work and the bog is covered with water in a few hours, and the crop saved.

There are some dry cranberry fields, artificially planted; but, while productive, they cannot be so certainly protected as the floodable bogs.

The number of commercial growers in the United States, is over two thousand. They are found mainly in the States of Massachusetts, New Jersey, Maine, Connecticut, Michigan, and Wisconsin, but Minnesota, Oregon, Rhode Island, Washington and New York, reported bogs. The number in Michigan and Wisconsin is on the increase despite a temporary set-back by forest fires.

A new field or bog is made by clipping and thrusting into the earth sprouts from vines not more than three years' old.

There are many varieties of cranberries. Over 100 of them, of good keeping and shipping qualities, were raised at the State Experiment Station at Madison, Wisconsin, in 1898, and exhibited at the succeeding cranberry convention. The United States consular officers report about an equal number in the Canadian provinces, the best of which are being transplanted to this country."

The foregoing facts from the United States Government officials at Washington contain much of interest, and may encourage those, fond of experimenting, to grow a few cranberries, furnishing artificially the necessary conditions.

WINTER PROTECTION OF HALF HARDY PLANTS.—It should be well-known to advanced gardeners, by this time, that light is as great an agent in destruction by frost as frost alone. But little practical advantage has been taken of this knowledge, except by gardening folk generally, of what the advanced gardeners know. The latter shades his greenhouse, when he finds the plants frozen,—and he plants rhododenrons and similar plants where the sun does not strike them in frosty weather, if he should have any choice in the selection of a site. In the extra cold region of the northwest, the advanced gardener shades the trunks of his fruit trees by placing boards, fastened together like tree-boxes, up against them. And thus the trees escape sunscald arising from being under the sunlight, and similar troubles.

Surely orange growers in Florida might profit by this experience of their northern brethren. It would not be a very expensive thing to make an arbor of lath over an orange grove—the lath being an inch or so apart. With such a partial shade the plants would probably endure ten or twelve spasmodic degrees of frost without injury,—and the shade in summer would doubtless be all the better for the trees,—at least the trunks of the trees might be boxed, and even filled with earth if the weight could be supported. If the tops should suffer from frost, the strong trunks would sooner recover, than when the whole tree was killed to the ground.

FORCING LETTUCE.—Lettuce matures so quickly, it is an excellent thing to grow under glass, interspersed with more permanent plants or occupying a bench by itself temporarily. It requires no more heat than is given a house of carnations.

While under ordinary good conditions it will generally give good results, those who want to have the best success will be interested in some experiments made at the Connecticut Experiment Station, and will profit thereby.

It was found that lettuce of better quality could be grown in a mixture of from 9 to 12 per cent. of peat moss with coal ashes. Black swamp muck with no fiber was less satisfactory than peat moss.

A number of comparisons were made of the growth on the same kind of compost which had been "sterilized" by heating it for one hour with live steam, which raises the temperature of the soil to above 100 C. In every case a better crop was grown on sterilized soil than on corresponding plots untreated. Lettuce transplanted from the seedling patch to the permanent beds was much larger and heavier than that which was twice transplanted. Fertilizer chemicals depressed the yield in each case, while the addition of lime did not greatly affect the weight or quality of the crop The plants were set 8 inches apart in the trial plots.

FRUITS FOR THE TABLE.—One of the most discouraging things that the housekeeper encounters frequently is the remarkable poor quality of some remarkably fine looking fruit. There is practically only one way to escape these troubles and that is to become familiar with the popular varieties. There are difficulties in the way, but if the purchaser is insistent to know what she is purchasing, the market will find it profitable to take pains to have everything named. Peaches are a good example of possible difficulties, as many of them look much alike to the average person,—but what differences in quality there are! In the case of apples, one could soon learn those which are most stable in quality; some are of very little account if kept too long, but are of finest quality early in the season and others will improve by keeping.

DRIED PERSIMMONS.—In Southern Illinois there are perhaps ten, fifteen or more varieties of the persimmon growing wild. So plentiful

PHLOX GLABERRIMA. FLOWERS PINK. (SEE PAGE 198.)

is the fruit during the early winter, that many bushels drop off and go to waste every year. Many varieties when fully ripe are simply excellent. If properly ripe, they are considered by some to be equal to imported dates, though different in flavor.—*American Fruit and Vegetable Journal.*

AUSTRALIAN RASPBERRIES.—Australian trees and shrubs have found themselves quite at home in California. Australian fruits seem to have the same tastes. Mr. S. L. Watkins, of Lotus, has been experimenting with them. One he has selected and named "Queen of Australia." He says the canes reach a height of ten or fifteen feet,—and that the fruit ripens before the Miller's Red and Hansel, which are the standards for earliness in that region.

BIOGRAPHY AND LITERATURE.

THE WEALTH OF LEARNING.

The helm may rust, the laurel bough may fade,
Oblivious grasp may blunt the victor's blade;
But that bright, holy wreath which learning gives,
Untorn by hate, unharm'd by envy, lives.—
GRAHAM.

E. W. BULL.—A correspondent calls attention to the date of the death of the originator of the Concord Grape as March 26, 1895. On page 238 of MEEHANS' MONTHLY for 1895, it is correctly given as September 27, 1895. The account recently given was condensed from a Boston paper sent to MEEHANS' MONTHLY for the purpose, and the error in the date not noticed by the compiler of the paragraph.

THE PINXTER-FLOWER. — A letter, in the issue for July, which attracted my attention, was from Mr. Geo. D. Hulst, from Brooklyn, N. Y., in which he opposes the idea of *Azalea viscosa* being a "Pinkster-flower." I am certainly not a judge about common names of American flowers, but I am a Hollander and know that, in Holland, pinksterbloem (not blume) is the blue German Iris, which grows in Holland everywhere along the borders of our rivers and ditches, and it is far more plausible that, when the first Dutch settlers around New York saw the purple flowers of *Azalea amoena*, or perhaps the *nudiflora*, they called it Pinksterbloem (Pinxer-flower) as that it has anything to do with the white robes of the children when they are christened. It may be new for Mr. Hulst, but it is true, that the children in Holland wear long robes when baptized. And it is new to me that Pinksterfeest (Pentecost) ever has been a special day for baptizing children, as in Holland, children are generally baptized in the church a few weeks after birth, as in the Protestant churches the mother is by custom (not by law) not allowed to go to church before the child has been christened. The children of Roman Catholics are mostly baptized the day after birth, so I hardly think that there has been a time that Whit-Sunday has been set as christening day, as Governor Colden said, and furthermore, the use of flowers is not customary at christenings in Holland. P. OUWERKERK.

IVY POISONING.—The U. S. Yearbook of the Department of Agriculture, p. 140, states—no doubt correctly—that toxicodendrol, the fixed oil of *Rhus*, is the cause of the poisoning, and that it is readily cured by acetate of lead. But the writer might have added that there is also a bacterium or microbe associated with rhus poisoning. As in so many other cases, the poisoning seems to have a two-fold origin. I am told that lime-chlorid will destroy the microbe at once. C. N. GREENE.

The cause of poisoning by *Rhus Toxicodendron*, the Poison Vine, has not yet been demonstrated so clearly as to meet unchallenged acceptance. Bacteria are found everywhere when the food they require is present; they starve and disappear after they have devoured all the food to be obtained. Bacteria are found in dew drops, and that they are found in the extracts of toxicodendron is no surprise. But if they are the direct cause of the poisoning by *Rhus*, the immunity of so many has to be accounted for.

DANGEROUS KNOWLEDGE.—A celebrated English writer, of the last generation, was celebrated for his asceticism. One saying with which he is credited is that "a little knowledge is a dangerous thing." This is particularly exemplified, at the present time, by the talks on microbes which come in the public prints. Just before us, as we write, is an article, in a magazine of some pretentions, which reads as follows:—"Fruit skins carry germs, and, when these are taken into the stomach, cause disease. The raw fruit, itself, is dangerous, and in many cases should not be eaten. Cooked fruit is in all cases preferable; but when fruit is eaten, the skins should always be discarded. They are full of microbes, which they catch from the atmosphere and retain." The folly of this is apparent when it is known that the number of disease-producing germs is infinitesimally small in comparison with those which are beneficial. Nearly all the operations of life are carried on through the agency of these microbes; there could be no life without them. Ninety per cent., at least, of all the microbes that are attached to fruits do no more injury than to eat a dish of oysters.

TREES IN NEW ZEALAND.—The drought in New Zealand has been very hard on tree-life. Some forty species of trees and shrubs were killed in the Christ Church public gardens, and others seriously injured. The summers in Canterbury are usually dry, but extremes, resulting in drought, are rare. The drouth in the fall of 1898, was followed by a severe winter for that region, the thermometer being variously reported as from 15° to 20° below freezing point.

Of California trees, *Pinus insignis* and *Cupressus macrocarpa* do very well. *Libocedrus decurrens*, and the Nootka Sound Cypress do well. Other California evergreens do not stand the drought very well.

GARDENING AS A DIVERSION.—One of the great advantages of a love of gardening, is the break it makes on the continuous strain of business thought. No real lover, and possessor of a garden ever died of insomnia. This is a disease which follows those by night who cannot throw off the thoughts of daily life. They retire to think, instead of to sleep,—and the darkness and quietness of the night favor the thought. To leave behind the business of the city for the pleasures of the trees and flowers of the suburbs, has saved numerous lives that would have otherwise been broken down. This seems better understood in the Old World than with us. The famous jurist, Lord Penzance, did not take his law studies to his country home. There he thought only of his garden, and the floral treasures it contained. One of his hobbies in the garden was the improvement of the Sweet Briar, and the many beautiful varieties he raised, obtained as much fame for himself as did his legal opinions, to say nothing of the pleasure the flowers brought him.

THE SPIRIT OF FLOWERS.—

If good angels in the sweet flowers dwell,
Who would not protect and love them well!

The senior editor of MEEHANS' MONTHLY makes such beautiful, appropriate poetic selection that I realize he needs no assistance in that department; but not to send a meagre letter, I will copy a few lines from an old volume, "Flora's Interpretee," by Mrs. Sarah Josepha Hale, published in 1839. The poem was a translation from the German, and after saying that bright angels make their homes in the flowers during their stay on earth, and keep them in repair as other householders do, and that when they go back to their heavenly homes the flowers wither and die, etc., she continues—

"If thou, my dear Lady, in truth art inclined
The spirits of heaven beside thee to find,
Make nature thy study, companion and lover,
And, trust me, the angels around thee will hover."

Then recommending the care of lilies and roses, and that their angels will be the guardians of those who water and cherish, both by day and night, and

"When thus thou are kept by a heavenly spell,
Shouldst thou, now and then, dream that I love thee right well,
Be sure that with fervor and truth I adore thee,
Or an angel had ne'er set mine image before thee." MRS. E. E. ORCUTT.

San Diego, Cal.

PUBLIC PARKS IN BELGIUM.—King Leopold of Belgium, who has been a life-long patron of gardening, has donated the whole of his real estate in that country for parks and pleasure grounds for the people for ever. He could not do anything better to have his name held in grateful remembrance as long as his country shall endure.

APPLE WEALTHY.—The spot on which the original Baldwin apple grew has been marked by a monument. The northwest is talking of doing something of the kind for the one known as Wealthy, introduced to public notice by the late Peter M. Gideon, of Minnesota, which has proved to be as great a public blessing to the fruit-growing and fruit-eating interests of that section as the Baldwin has been to the East.

GENERAL NOTES.

HORTICULTURAL EDUCATION.—In many parts of the Old World horticulture is made part of a polite education. No one would feel obliged to say "griddle-cake flower," for fear of being thought affected if he used the Latin word *Verbena*. But with us there seems a general disposition to ridicule any one who ventures to show an interest in any intelligent subject outside of a discussion of the latest novel. The general ignorance of the simplest fact of gardening is remarkable,—but it is probably no greater in gardening than in other intelligent matters.

Probably much of this degeneration is due to the fact that professionals are doing most of the teaching. Educational serials, especially, are awful examples. If any ordinary persons were to talk as these people write, it would be no wonder if "learning" was under a popular cloud. Even though one of them may write so that we may dispense with a Latin or Greek dictionary at our elbow, the thoughts of the writers are so confused by the language, that the sentences are often unintelligible. Now before us, one writes: "Dr. Warner studied a vast body of school children with a view to their classification upon the basis of actual capacity (to learn). Tables embodying the results of his examinations of 50,000 cases bear out his theory. Certain developmental defects and nerve signs are supposed to correspond to a low or disordered condition of the brain. The examination of 100,000 children as to the presence or absence of these signs and defects, and the comparison of the results with their school record and with the opinion of their teachers confirms the author's belief in the soundness of his theory." It is the province of good language to convey clear ideas. Under ordinary school arrangements, it would take at least ten minutes to examine, record and compare with the teacher's experience as narrated in each child's case,—so we are to understand that Dr. Warner was engaged for fully 365 days, 10 hours a day, for 4 years in the endeavor to prove a "theory," which after all seems to have been but a hypothesis. Usually, also an examination and a comparison might confirm something, but in this case they "confirms" it.

Another article tells of the large number of school teachers who took a trip to Europe this year, and an examination of the steamers' registers, which showed so many of the ladies' names with the "prefix, Miss, before them," —as if a "prefix" could possibly be behind them.

It is experience of this kind that discredits intelligence. We may smile at "Higher Education," and yet hope that a love of sound intelligence will yet advance.

VACATION SCHOOLS. — Mrs. Seliger, Hartford, Conn., says:—"Since the inauguration of our *first* vacation school, by Miss Alida B. Clark, under the patronage of the ladies of the Civic Club, you mentioned in the June number of your magazine, we have had a second term of them in two schools last summer led by the same club of ladies who also have the expenses of them. This year they begin in three places when the public schools close and the City Council has granted, upon petition, a sum sufficient to carry it out as proposed. We mean not to be tardy in any good purpose."

PRESERVING NATURE. — America is doing well in preserving areas of special interest by government purchases. In England, there is a public society known as the National Trust, that is buying up tracts for the purpose of preserving wild plants and animals of rare value in natural history. Part of a huge swamp, known as Wicken Fen, has recently been purchased by this society for this laudable purpose.

WALNUTS IN CALIFORNIA.—Some idea of the extent of walnut culture in California may be formed from the fact that a single large association, in southern California, advertised for bids for 70,000 sacks to be used in the shipping of the coming crop.

GRINDELIA SQUARROSA

GRINDELIA SQUARROSA.

GUM PLANT.

NATURAL ORDER, COMPOSITÆ.

GRINDELIA SQUARROSA, Dunal – Commonly only a foot or two high and branched from the base; leaves rigid, cauline, from spatulate- to linear-oblong, and with either broadish or narrowed half-clasping base, acutely and often spinulosely serrate or denticulate; sometimes radical and even cauline, laciniate-pinnatifid, involucre strongly squarrose with the spreading and recurving short-filiform tips of the bracts; outer akenes commonly (but not always) corky, thickened and with broad, truncate summit, those toward the centre narrower and thinner-walled and with smaller areola. Gray's *Synoptical Flora of North America*. See also Britton and Brown's *Illustrated Flora of the Northern United States, Canada and the British Possessions.*

The very pretty and interesting plant here illustrated, a native of our territory that was once known as the Western Plains, affords, in its family history, a good lesson in nomenclature to the student in botany. Frequent changes of name are vexatious, but in many cases essential, if not always desirable. Here is a family of plants, now known as *Grindelia*, that not a hundred years ago was not distinguished from *Aster*, and the first one was described by Cavanilles about the incoming of the nineteenth century as *Aster glutinosus*, the species founded on specimens or seedling plants received from Mexico. Willdenow, following with his "Species Plantarum," transferred it from this to the old Linnæan genus, *Doronicum*, and it became *Doronicum glutinosum*, though he takes occasion to remark that it has a different appearance from the rest of that genus, especially in regard to the imbrication of the calyx, as the mass of involucral scales was termed in that day. In 1807, Willdenow, in a Berlin magazine, separated it again; made of it a special genus, and it became *Grindelia glutinosa*, so far retaining the family name. Coming to *Grindelia squarrosa*, of which this chapter treats, it was first discovered by the celebrated explorers, Lewis and Clark; and Robert Brown, seeing good generic characters not before observed, made for it a separate genus, *Donia*, and it appears in *Hortus Kewensis*, in 1813, as *Donia squarrosa*. Under this title it passed till 1836, when Dunal, in Decandolle's *Prodromus*, showed it to be not essentially different from *Grindelia*, the prior genus, and botanists have accepted it as *Grindelia squarrosa* since that date. We see from this history that changes are unavoidable. The discovery of new species, or of new forms of old species, shows characters, once thought important, to be in a measure trivial; or, on the other hand, strengthens those that may have been regarded of small account. The new names result from new discoveries.

It is to be regretted that the name *Donia*, established by Brown, and given to this plant as *Donia squarrosa*, by Pursh, when describing Lewis and Clark's plants in 1814, could not be retained, as commemorative of a very worthy man, George Don, a Scotch gardener, and subsequently a nurseryman at Forfar, in Scotland. Like many gardeners of the past age, he was very fond of botany, and had a pride in collecting living plants for the pleasure he derived from their study. His two sons, George and David, became famous botanical authors and teachers, David being widely esteemed as Professor of Botany in King's College, London.

As already noted, the specimen described by Pursh, was collected by Lewis and Clark, and is still preserved in the Academy of Natural Sciences, of Philadelphia. In Lewis' fine handwriting appears on the sheet "Prairies, in the camp near the old Maha village, August 17th, 1804." It may be noted here, that the dates marked on each paper of specimens do not always correspond with the dates in the itinerary of the journey, and are evidently the dates when the specimens were dry enough to

COLOR PLATE

GRINDELIA SQUARROSA.

GUM PLANT.

NATURAL ORDER, COMPOSITÆ.

GRINDELIA SQUARROSA, Dunal – Commonly only a foot or two high and branched from the base; leaves rigid, cauline, from spatulate- to linear-oblong, and with either broadish or narrowed half-clasping base, acutely and often spinulosely serrate or denticulate; sometimes radical and even cauline, laciniate-pinnatifid, involucre strongly squarrose with the spreading and recurving short-filiform tips of the bracts; outer akenes commonly (but not always) corky, thickened and with broad, truncate summit, those toward the centre narrower and thinner walled and with smaller areola. Gray's *Synoptical Flora of North America*. See also Britton and Brown's *Illustrated Flora of the Northern United States, Canada and the British Possessions.*

The very pretty and interesting plant here illustrated, a native of our territory that was once known as the Western Plains, affords, in its family history, a good lesson in nomenclature to the student in botany. Frequent changes of name are vexatious, but in many cases essential, if not always desirable. Here is a family of plants, now known as *Grindelia*, that not a hundred years ago was not distinguished from *Aster*, and the first one was described by Cavanilles about the incoming of the nineteenth century as *Aster glutinosus*, the species founded on specimens or seedling plants received from Mexico. Willdenow, following with his "Species Plantarum," transferred it from this to the old Linnæan genus, *Doronicum*, and it became *Doronicum glutinosum*, though he takes occasion to remark that it has a different appearance from the rest of that genus, especially in regard to the imbrication of the calyx, as the mass of involucral scales was termed in that day. In 1807, Willdenow, in a Berlin magazine, separated it again; made of it a special genus, and it became *Grindelia glutinosa*, so far retaining the family name. Coming to *Grindelia squarrosa*, of which this chapter treats, it was first discovered by the celebrated explorers, Lewis and Clark; and Robert Brown, seeing good generic characters not before observed, made for it a separate genus, *Donia*, and it appears in *Hortus Kewensis*, in 1813, as *Donia squarrosa*. Under this title it passed till 1836, when Dunal, in Decandolle's *Prodromus*, showed it to be not essentially different from *Grindelia*, the prior genus, and botanists have accepted it as *Grindelia squarrosa* since that date. We see from this history that changes are unavoidable. The discovery of new species, or of new forms of old species, shows characters, once thought important, to be in a measure trivial; or, on the other hand, strengthens those that may have been regarded of small account. The new names result from new discoveries.

It is to be regretted that the name *Donia*, established by Brown, and given to this plant as *Donia squarrosa*, by Pursh, when describing Lewis and Clark's plants in 1814, could not be retained, as commemorative of a very worthy man, George Don, a Scotch gardener, and subsequently a nurseryman at Forfar, in Scotland. Like many gardeners of the past age, he was very fond of botany, and had a pride in collecting living plants for the pleasure he derived from their study. His two sons, George and David, became famous botanical authors and teachers, David being widely esteemed as Professor of Botany in King's College, London.

As already noted, the specimen described by Pursh, was collected by Lewis and Clark, and is still preserved in the Academy of Natural Sciences, of Philadelphia. In Lewis' fine handwriting appears on the sheet "Prairies, in the camp near the old Maha village, August 17th, 1804." It may be noted here, that the dates marked on each paper of specimens do not always correspond with the dates in the itinerary of the journey, and are evidently the dates when the specimens were dry enough to

COLOR PLATE
INTENTIONAL SECOND EXPOSURE

put away. Lewis had evidently noted some distinction from ordinary plants, as "*Anonymous balsamifera*" was written on the label, and, following the above note appears, in Pursh's handwriting, *Demetria spathulata*, a provisional name he had to drop on his arrival in England on account of Brown's previous selection of *Donia*. The name *Demetria* seems to have been suggested by the clean, cut-away form of the young flower head, resembling a hemisphere.

Among the most fascinating of modern studies in plant life is the subject of variation. It has an intimate relation with the origin of species, which, as the modern thought runs, has been the result of great variation during the lapse of time. In this respect, *Grindelia squarrosa* is a very interesting plant, its range of variation being very wide. The description quoted from Dr. Gray notes that the leaves are acutely serrate—in our specimen the serratures are by no means sharp. He adds that they are often spinulosely serrate or denticulate; but the Pursh specimen before referred to is not merely spinulose, but has long ciliæ at the apex of the leaves. On the other extreme are specimens before the writer from the Seton River Mountains, that have very narrow leaves, and the margins almost entire. Generally, the herbarium specimens gathered by various collectors in different places, and showing variations in characters, are supposed to be typical of the whole series in the separate localities, and on this supposed fact has been constructed theories of local variations caused by supposed special local conditions. But the author, in studying the *Grindelia* in its haunts in Kansas and Colorado, has found the most extreme forms, in a comparatively limited area, by looking for them. The fact that, in geographical locations widely separated, differing forms prevail, must be accounted for in some other premise than environment. Isolated plants of this *Grindelia* are often found to have wandered from a distant home. One plant was found, several years ago, by C. D. Lippincott, at Swedesboro, N. J., and another plant was found by Isaac Burk on the ballast ground near Philadelphia. As heredity goes hand-in-hand with variation, it may easily be understood that the peculiar character of some supposed geographical variety may have been due to the character of the first immigrant settler, as much at least as to "conditions of environment."

Another interesting study of modern times is that of motion in plants. In many compositæ, the faces of the leaves, instead of the margins, are horizontal, and it has been supposed, in some instances, that the edges of the leaves range due north and south. These are known as compass plants. The author, in his earlier studies, was inclined to believe in the soundness of this view, but has had to abandon it on more extended observations. The earlier assent to the proposition can only be accounted for on the hypothesis that one can often see what is sought for. When told to see the compass plant, we believe we see it. It is now understood that the spiral direction of the growth-force, that in most plants does not manifest itself beyond the axis, extends in numerous composites to the ribs or veins of the leaves. It is these twists which set the leaves on edge, and the twist has, therefore, no relation to polarity. In some species of the family the twist occurs in the petiole near the junction with the stem, at other times near the middle of the leaf; and again, as in some Senecios and Centaureas, there may be two or even three coils twisting the leaf into a ringlet form. In *Grindelia squarrosa*, as we see by the picture, the twist occurs just below the middle of the leaf, and only the upper portion is vertical.

In naming the original plant *Donia viscosa*, Pursh had in view the extremely viscid secretion that covers the leaves to such an extent as to give them a singularly bright and glossy appearance. The purpose served by this gum in the economy of the plant has not been ascertained. In some of the species, the gum has been supposed to have strong medical virtues. It has given rise to its common name of Gum Plant.

Whether Grindel, in whose honor Willdenow now dedicated this beautiful American genus, did much service to the progress of botany, is not known. It was probably a personal compliment. About all the biographies say of him is that John Grindel was a Professor of Botany at Riga, and that he was born in 1776, and died in 1836.

EXPLANATION OF THE PLATE.—1. Lower section of a stem from a Kansan specimen. 2. Flowering branchlets. 3. Vertical section of a flower, showing the receptacle, with its spreading scales.

WILD FLOWERS AND NATURE.

TALES OF THE WOODS.

"Of brown nuts crackling down from the bursting burs
In the autumnal days—of bowery vines
Festooned from branches of the oak and elm,
Of fragrant walnuts twined upon their sprays,
Of pines that gave a murmur like the sea,
Yet whisper of their distant mountain haunts,
And of all pleasant forest-sights and sounds—
Of greenwood-vistas, of the waterfall,
Where all the air is filled with rainbows—then
The plashing brook—the spotted thrush that sings
Deep in the glen."

HOWARD WORCESTER GILBERT.

HORNETS' NESTS AND PAPER FROM WOOD-PULP. — The wasp was the first manufacturer of paper from wood-pulp, and it began the business before man was created. Paper from wood-pulp has been made but a few years, and most any person of this generation can remember when it was not made. Such an old thing as paper made from rags, as it was, first began centuries ago, solely on account of printing purposes; and now there are more uses for paper for other purposes than printing, that we could not get along without paper. It is one of the wants of man as well as one of the luxuries. To be sure, in the backwoods or on some solitary Juan Fernandez island, paper would not cut any figure, but in civilized countries men must have it. I was sitting, resting my wearied muscles on a one-legged stool (I merely mention the one-legged stool to let your readers understand that I am not a member of any trust or combine and cannot afford to rest upon velvet and brocade cushions) near a gateway with unpainted posts of oak, when my attention was called to a wasp, the kind which is in the habit, like the hornet, of building paper nests. It was crawling or walking up the face of the post, then walking back. It seemed to be searching for something. Presently it exuded from its mouth, as it began the ascent again, a liquid, which it placed on the wood in a narrow streak about two inches long, then it backed down again and with its jaws began scraping up the softened wood, or what is called weather-worn wood, which it rolled up into a ball and then flew away with it to the nest it was building on some window or door-jam nearby. It might not be generally known that the mud-dauber wasps visit the water pools for water as well as mud. They carry both mud and water, to their nests, for building purposes. At other times these wasps will find water at one place, where there is no mud handy, and will carry it to a considerable distance, say to a dried-up pool, where they have been in the habit of obtaining their mud, and will moisten the dried mud, which they will roll up and carry away. I have known it for years that both the hornet and wasp obtain their building materials from the old weather-worn snake fences of chestnut rails which are so plentiful in the East. Here in this country, where there is no chestnut, they make use of the oak or pine fences, but any dead wood which is sound and free from bark is used by them. But water they must have if the wood is dry, and they carry the water to the wood. They do not do this carrying business all of the time, for when the wood is wet from the rains and dews, then is their favorite time for work at nest-building.

F. K. STEELE, Festus, Mo.

SPIRANTHES SIMPLEX, GRAY.—A number of years before this little plant, belonging to the Orchis family, was raised to a specific rank, it grew in a lane belonging to a farm in Conestoga Valley, Berks County, Pa. In September, 1884, it was detected growing among Haircap Moss (*Polytrichum commune*, Linn), in a sandy ravine in Manor Township, Lancaster County. Although bearing some resemblance to *Spiranthes gracilis*, Bigelow, it differs from it in having a solitary tuberous root and a smaller spike of pure white flowers, the lip being white. In 1889, I noticed, in Gray's Manual, that it was named *Spiranthes simplex*,

Gray. In 1892, two specimens having roots were named and sent to one of our local botanists, who thus answered the sender, "*Spiranthes simplex*, Gray; this is a nice discovery. It is new both to the County and the State. I would like to retain the specimens. The plant should be in the State Home so that the finder would have the reward of his find." When Britton and Brown published their "Illustrated Botany of the Northern United States," they gave the plant to New Jersey and Maryland. I suppose it was not reported to them from Pennsylvania.

September 1, 1899, it was again found growing on a sandy part of the Welsh Mountain near Beartown, Lancaster County. If any of our local botanists, in their excursions, have found the plant, I would like to hear from them in the columns of your magazine. The plant, though small, has always been a favorite of mine. I used to think that it resembled a small blade of wet grass when the sun shines on it, and called it "Little Dewdrop." It is difficult to cultivate. I have planted a large number of them with very little success.

AMELIA F. EBY.

Lancaster, Pa., September 3, 1900.

GRINDELIA SQUARROSA.—In addition to the main chapter on *Grindelia* in this issue, it may be noted that the greatest number of species in found in Mexico. Some reach Chili on the South, and our species is the most Northerly species of the family. It is a great traveler, and has been collected from Western Canada to Texas, and though originally not found far east of the Rocky Mountains, has, during recent years, been traveling eastwardly at a rapid rate.

LIFE AND GROWTH IN PLANTS.—One of the commonest of cactuses in gardens is the *Echinopsis multiplex*, a small sub-globular species, with five or six sharp ribs, and sparsely sprinkled with a few clusters of long black spines on the sharp edges of the ribs. It sends up, occasionally, a large white tubular flower, which, like so many of the family, opens at night, and soon withers away. In Germany, a druggist, named Ludwig Rust, placed a specimen under a sealed glass case seven years ago, and it is said to be yet in a "thriving condition," to the surprise of the scientific men of Berlin, who are puzzled to know where it obtains its carbonic acid from. Many suggestions are advanced as to the source of this element. So far as the published account goes, however, there is no indication that the specimen was weighed before it was encased, or weighed after its seven years of entombment—no evidence, it may be said, that any carbonic acid was absorbed. It is just as likely to be a case of dormancy. It is now well understood that in the absence of exciting causes, dormancy in vegetation may be retained indefinitely.

MISTLETOE ON AN APRICOT.—The *Pacific Rural Press* figures a species of Mistletoe, native to California, that has grown on the branch of an apricot. It shows how plants can adapt themselves to new conditions, the home of the apricot being Asia. After all, these parasites, themselves, are good illustrations of this. These parasites probably started life in the earlier ages as other trees and plants do—and as the *Cuscuta*, or Dodder, does now—and eventually found it as well to live wholly on trees. Logically, a plant could not attach itself to a tree, until there was a tree to be attached to. Parasitism must then have been a later event in the great work of evolution.

METEOROLOGY AND VEGETATION.—The English peasantry, during past ages, have been fond of recording their observations in natural history by versification. In regard to prognostication of the weather, the lines read:

> "When the oak is out before the ash,
> Then 'twill be but a little splash;
> When the ash is out before the oak,
> Then the summer will be a soak."

We learn further by this that these plain people knew, long ago, that there was no regularity in the sequence of leafing or flowering. A plant, among the earliest in this respect one season, may be a laggard in another. And yet to-day many of our learned fellows are constructing floral calendars by noting the times when floral activity appears.

GENERAL GARDENING.

AUTUMN FRUITS.

Full slow to part with her best gifts is Fate;
The choicest fruitage comes not with the Spring,
But still for Summer's mellowing touch must wait,—
For storms and tears, which season'd excellence bring,
And Love doth fix its joyfullest estate
In hearts that have been hushed 'neath sorrow's brooding wing.

FLORENCE EARLE COATES.

DISEASE IN BIRCH TREES.—A Buffalo correspondent, interested in the note on the birch disease, in a recent issue of MEEHANS' MONTHLY, sent to a leading horticulturist in New York an inquiry, and received the following reply:

"I am very sorry to say I cannot give you any definite information about the trouble with the White Birch. I have noticed the same difficulty in *many places*, but so far as I am aware, no one is quite sure what the cause is. I am very certain that the dying of the birches occurs *where there are no borers*. I have thought sometimes that it was due to the natural death of the tree when it reaches its full longevity. On the other hand, I have seen some trees die which appeared still to be in vigorous growth. The thing I have always recommended is to cut back the tree heavily, below the diseased parts, in the hope that new wood might arise and the tree outgrow the difficulty. I should also apply a little commercial fertilizer to the tree."

It so happens that, when the first specimen of a diseased birch was brought to the attention of the writer, he at once perceived the analogy between the effect, and that produced by a ferment fungus on the Japanese Ivy, apple, pear, quince and so forth; but when this opinion was expressed, he was silenced by receiving specimens of birch branches bored to a mere shell. He adopted the borer idea without further thoughts of the matter. Since receiving this communication, he has made a more thorough examination, and now suspects that it is the work of a ferment fungus, just as in the "Fire Blight," "Frozen-sap Blight" and similar manifestations in other trees. The spores obtain an entrance in some local spot, and there germinate, destroying the tissue rapidly for many inches. The fermenting sap is carried up through all the portions of the tree above the local point of attack, poisoning as it goes. In the birch, as in other trees, this view seemed verified by one with a penknife, shaving the bark from the local point of attack upwardly.

It is possible that a practised eye, going carefully over a tree trunk in early spring, penknife in hand, might discover the local attack, and by cutting all out to the healthy bark, and washing with a copper solution, save from further progress—but people are so unaccustomed to look in advance for hidden trouble with trees, that one might almost say there is no practical remedy. As with the "Fire Blight," these troubles usually wear themselves out. It is by no means certain, however, that this is the cause.

TWO SATISFACTORY HOUSE AND DECORATIVE PLANTS.—Foliage plants that may be considered all-around satisfactory for house and general use in decorations are really very scarce. Where the best of care is given them, quite a list might be made; but quite naturally, in the majority of cases, the care of such plants is very irregular, and under adverse heating and ventilating conditions they suffer more or less. No better plants, at the same time very ornamental, can be named than *Asparagus Sprengeri* and the Boston Fern, *Nephrolepis exaltata Bostoniensis*. Very large specimens of either are remarkably handsome, and show off particularly well if grown in large baskets or placed on pedestals where the graceful stems may show off to greatest effect. Then, too, they come in useful for other purposes, as the stems may be cut and worked into bouquets of flowers very effectively.

ENGLISH BIRD CHERRY.–To those who admire beautiful trees, it is a surprise that the English Bird Cherry is not planted more frequently. It has special beauty at all seasons. The habit of the tree is rather that of a gigantic shrub, as it is fond of sending out branches from the base of the main trunk near the ground, which soon compete for leadership with the main trunk. Those who desire to have a clean, straight bole, keep these cut away. It then makes a tree of 25 or 30 feet high. But when these basal shoots are left to grow, it assumes a pretty, regular growth, as seen in the annexed illustration. In early spring it is clothed with drooping cylindrical racemes of white flowers, followed in summer by large, shining black berries, so attractive to birds, that the name Bird Cherry was probably derived from it. Finally, in our country at least, the leaves turn to a rich brown color, very unusual in European trees.

CERASUS PADUS. ENGLISH BIRD CHERRY.

The specimen illustrated is growing on the grounds of Mrs. Theodore Presser, in Germantown, Philadelphia. On the left is seen a specimen of what the German and French nurseries send out as *Catalpa Bungei*, which has no close relation to that Japanese species, but is a dwarf form of our common American Catalpa grafted on the tall stem of the normal form. The name cannot, however, be changed, since it has become so widely distributed. The specimen on these grounds is regarded as remarkably fine.

SCHOOL GARDENS.–In the MONTHLY for July, 1900, was a very suggestive article on School Gardens, and it makes one's heart ache to know the benefit to be derived from such work as pursued and recommended by R. Bingham, but not universally adopted. Botany, as has well been called, is, indeed, the "amiable science." In it are found at once the useful and agreeable. And nothing can seem sweeter than that children, who universally are attracted even to a flowering weed, should have this necessary instruction to go with them through life, as not only a pleasant memory, but also a daily blessing. When so much time is consumed over work of little value, it would be so delightful to find some passing moments filled with an interest and a knowledge of common things. The different trees of their native forest, the seeds they produce, the birds that build their nests in them. The inhabitants of the bright oak apples or excrescences, a whole world full of wonder and beauty, but the mind untaught, the eye to see, becomes neglectful of these every-day beauties, and companionship is sought instead in artificial and sometimes harmful pleasure. The mind preoccupied with the wealth that Nature offers in garden, field, and forest, would it not rise higher and higher to adore the author of so much that is wonderful, beautiful, useful?

MRS. E. E. ORCUTT.

THE EUROPEAN LARCH — The annexed illustration of an European Larch is taken from a tree growing on the Chew grounds, the famous turning point in the battle of Germantown, when Washington moved to retake Philadelphia from the British General Howe. A glance at the picture is sufficient to inspire one with its beauty. Though a deciduous tree, it is one of the Coniferous family, though its slender, graceful branchlets would seem to dispute the fact. The flowers, ultimately becoming small cones, appear very early in Spring. They are of a deep purple tint, and give the tree as gay an appearance as many trees that are classed especially among flowering plants.

EUROPEAN LARCH.

SEEDLINGS DAMPING OFF.—Raisers of flower seeds or of cuttings well know the trouble from a fungus attack, which rots away the young plants. In many cases, hundreds are lost in a single day or night. Mr. Worthington G. Smith, one of the most practical of English mycologists, explains, in the London *Gardeners' Chronicle*, that this is the work of a microscopic fungus of the genus *Pythium*, and gives the following account of the process:

"It has thick-coated resting spores, which, judging from the frequent damping-off amongst seedlings, must be abundant in all gardens or wherever plants are growing. These spores germinate in damp, badly ventilated places, especially where moderately warm; in all plant-houses they must be continually germinating. The fungus can maintain itself on decaying vegetable matter, such as is abundant in all rich soils; if, however, it comes in contact with living plants in a tender condition, with the outer skin, as it is in seedlings, still unhardened, then it attacks the plant and gets inside it, attracted by the nutritious substances present there. Thus it comes that *Pythium* appears first at the neck of the plant on the ground level. The seedling is soon girdled, and the upper parts deprived of nourishment, then droop; the soft, rotting neck can no longer support the stem upright, so it topples over, and is soon covered with the damping-off fungus and various other moulds."

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rible new weed, and of the special means to be employed with every different species. They remind us of the famous recipe for killing fleas, namely, to place them between the two thumb nails and crush them. The practical cultivator seldom cares to know even the name of a weed. He knows that if he keeps the cultivator or the hoe going as it should go, during the growing season, there will be an end of the most pernicious plant. No plant can live if prevented from making full-grown leaves for a single season.

A MASS OF AILANTUS GLANDULOSA.

THE AILANTUS IN LANDSCAPE GARDENING.—The Ailantus has two disagreeable features. It is liable to throw up suckers innumerable, and, for a few days, while the male flowers are open, the odor to many persons is annoying. But it has so many points of interest that it cannot be wholly overlooked in landscape gardening. Along the rocky banks of the Wissahickon, and doubtless in many other places in our country, it has become wild, and adds materially to the beauty of isolated masses of vegetation. The annexed illustration is from a photograph of one of these views. The suckering is of no account among these barren rocks, and it does not flower much under a couple of score of years. Indeed, it is only of the male trees that nausea is experienced. The female has less odor,—and, indeed, if it equalled the male, it would be worth enduring by reason of the glorious beauty of the tree when ripening its winged seeds in the fall. It may be noted here that the name was written by the botanist who described it, as *Ailanthus*, evidently by a slip of the pen, as it is meaningless, while he stated, at the same time, that he derived it from the Malayan common name of the tree *ailañto*, which signifies "tree of heaven," in allusion to its rapid growth skyward, and the name should, therefore, be *Ailantus*. It is one of the healthiest of trees in crowded cities.

UNCOMMON FORCING PLANTS.—One of the choicest forcing plants is *Doronicum plantagineum excelsum*, a very large-flowered, yellow composite. Unlike most yellow composites, it is early blooming and dwarf, the flowers frequently measuring five inches across. There is nothing coarse about the flowers, which have long, slender, numerous petals. Flower buds show amongst the leaves about four inches above the ground; the stem elongates and the flower opens when about six inches height is reached. The stem continues to elongate and the flower increases in size, until the stem is about two feet high, when the flower fades away to be replaced by another below it. The flowering period is in this manner continued for about two months. The flowers last well cut.

ENGLISH BEECH.—All know the beech by its smooth bark, which never has a rough edge, and by its leathery leaves, always smooth and shining. Few trees are more striking when it has room to develop itself. The annexed illustration is from a tree on the old battle ground of Germantown, and has been planted about thirty-five years.

ENGLISH BEECH.

GALAX LEAVES.—It is conceded by florists that no more useful decorative material has been found than the Southern Galax leaves. These comparatively small round leaves, of a brilliant green and bronze color, are very tough and lasting, and are made into leaves or used in bunches as the nature of the decoration may require. They are even used to encircle bunches of violets.

POINSETTIAS FOR CHRISTMAS DECORATIONS.—The Poinsettia is a very popular plant for use in decorations about Christmas time, and when well-grown is certainly very effective. There is what is termed a double variety, having an extra supply of the scarlet bracts usually looked upon as petals, which is very desirable, being a little showier and more lasting. Branches with these bracts may be cut and used as desired, or the entire plant. They will not stand the cold very well, the leaves dropping at a fall in temperature, but the bracts remaining on till the last.

LESPEDEZA BICOLOR AND DESMODIUM PENDULIFLORUM.—As Mr. Ouwerkerk says, in the August MONTHLY, the two are very distinct in habit and time of flowering, and could not easily be sent out for the same thing. The first being a hardy, straggling shrub, flowering here July 10th, while the *Desmodium* makes an annual growth from the root-stock, and flowers about September 10th.

J. HOLLOWAY.

Dosoris Park, Glen Cove, N. Y., August 4th.

It is well understood that there are two distinct plants under the separate names, but the names became confused. *Desmodium penduliflorum* got to be the widely distributed name for what is really *Lespedeza bicolor*. Efforts to transfer to each its correct name have been unavailing.

REPLANTING FOREST TREES.—The future of walnut timber has been provided for in Kansas, by extensive planting. This foresight has not been in evidence in the eastern section of our country. It is now said, however, that the Potts family, at Nantmeal, in Eastern Pennsylvania, have set out thirty acres of Black Walnut trees. This tree has an advantage in bringing in revenue by its nuts long before being of value for its timber.

RANUNCULUS REPENS Fl. Pl.—A double-flowered buttercup may suggest itself to many persons chiefly in the light of an oddity; yet it is more than that. The flowers are fairly abundant, and are so borne as to be useful for cutting. The foliage is a dark, shining green.

rible new weed, and of the special means to be employed with every different species. They remind us of the famous recipe for killing fleas, namely, to place them between the two thumb nails and crush them. The practical cultivator seldom cares to know even the name of a weed. He knows that if he keeps the cultivator or the hoe going as it should go, during the growing season, there will be an end of the most pernicious plant. No plant can live if prevented from making full-grown leaves for a single season.

A MASS OF AILANTUS GLANDULOSA.

THE AILANTUS IN LANDSCAPE GARDENING.—The Ailantus has two disagreeable features. It is liable to throw up suckers innumerable, and, for a few days, while the male flowers are open, the odor to many persons is annoying. But it has so many points of interest that it cannot be wholly overlooked in landscape gardening. Along the rocky banks of the Wissahickon, and doubtless in many other places in our country, it has become wild, and adds materially to the beauty of isolated masses of vegetation. The annexed illustration is from a photograph of one of these views. The suckering is of no account among these barren rocks, and it does not flower much under a couple of score of years. Indeed, it is only of the male trees that nausea is experienced. The female has less odor,—and, indeed, if it equalled the male, it would be worth enduring by reason of the glorious beauty of the tree when ripening its winged seeds in the fall. It may be noted here that the name was written by the botanist who described it, as *Ailanthus*, evidently by a slip of the pen, as it is meaningless, while he stated, at the same time, that he derived it from the Malayan common name of the tree *ailañto*, which signifies "tree of heaven," in allusion to its rapid growth skyward, and the name should, therefore, be *Ailantus*. It is one of the healthiest of trees in crowded cities.

UNCOMMON FORCING PLANTS.—One of the choicest forcing plants is *Doronicum plantagineum excelsum*, a very large-flowered, yellow composite. Unlike most yellow composites, it is early blooming and dwarf, the flowers frequently measuring five inches across. There is nothing coarse about the flowers, which have long, slender, numerous petals. Flower buds show amongst the leaves about four inches above the ground; the stem elongates and the flower opens when about six inches height is reached. The stem continues to elongate and the flower increases in size, until the stem is about two feet high, when the flower fades away to be replaced by another below it. The flowering period is in this manner continued for about two months. The flowers last well cut.

ENGLISH BEECH.—All know the beech by its smooth bark, which never has a rough edge, and by its leathery leaves, always smooth and shining. Few trees are more striking when it has room to develop itself. The annexed illustration is from a tree on the old battle ground of Germantown, and has been planted about thirty-five years.

ENGLISH BEECH.

GALAX LEAVES.—It is conceded by florists that no more useful decorative material has been found than the Southern Galax leaves. These comparatively small round leaves, of a brilliant green and bronze color, are very tough and lasting, and are made into leaves or used in bunches as the nature of the decoration may require. They are even used to encircle bunches of violets.

POINSETTIAS FOR CHRISTMAS DECORATIONS.—The Poinsettia is a very popular plant for use in decorations about Christmas time, and when well-grown is certainly very effective. There is what is termed a double variety, having an extra supply of the scarlet bracts usually looked upon as petals, which is very desirable, being a little showier and more lasting. Branches with these bracts may be cut and used as desired, or the entire plant. They will not stand the cold very well, the leaves dropping at a fall in temperature, but the bracts remaining on till the last.

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INTENTIONAL SECOND EXPOSURE

NEW OR RARE PLANTS.

GALENA WEEPING ELM.—The American White Elm, *Ulmus Americana*, often takes on a semi-pendulous, graceful habit, on which account, joined with a comparatively rapid growth, it is a favorite with planters. It does better in cities for streets and small parks than many other trees. The variety here illustrated is a very strong grower, with the branches curving downwards much as a weeping willow, which in habit indeed it much resembles. It

WEEPING ELMS. AT ENTRANCE TO MEEHANS' NURSERIES.

was found wild near Galena, the home of General Grant, in Illinois, by a citizen of that place named Beebe, about 30 years ago. The illustration represents a pair of about that age, from the grafts sent by Mr. Beebe, at the entrance to the Meehan Nurseries. It was supposed when first distributed to be a variety of the *Ulmus fulva*, but proved on flowering to be as above described. The two specimens, drooping nearly to the ground, are remarkably beautiful, and well suited to their position at the entrance; but they would make equally desirable lawn specimens.

THE HARDY FLOWER GARDEN.

WINTER PROTECTION OF TRITOMAS.—It was only within recent years that the tritoma, popularly known as Red-hot-poker plant, was demonstrated to be fairly hardy in the North. Blooming so late in the season, it is a valuable plant in the flower garden, and worthy of considerable attention.

Plants that are set out this Fall should be well protected the first winter by a good mulch of leaves. This material is better than manure for plants inclined to succulency, excessive moisture in winter being undesirable.

IMPROVED PÆONIES.—Mr. H. A. Terry, of Crescent City, Iowa, has devoted a number of years to the improvement of this lovely genus of hardy herbaceous plants. After discarding numbers of the more inferior seedlings, he has a list of ninety-four named varieties. It is probably one of the finest collections in the world.

FRUITS AND VEGETABLES.

GRAPES IN MINNESOTA.—Prof. Greene, of the Minn. State Experiment Station, has the following to say of grapes in that State:

"This year Campbell's Early fruited for the first time, and appears to be a very promising variety. Beta is a very hardy variety, which originated at Waconia, and which for many years has been grown in a small way in that section, and found to be exceedingly hardy, and able to stand fully exposed through some of our most severe winters." Worden, Moore's Early and Agawam are also mentioned as being satisfactory.

PEACH TREE DISEASE.—A Harrisburg correspondent says:

"Along the foot of the South Mountain, the eastern boundary of Franklin County, and extending into Washington County, Md., there are large peach orchards. As might be expected, 'yellows' have been injuring the trees, and in some places has ruined large plantations. There is a picnic ground, Pen Mar, near the top of the mountain, and it is said to have an elevation of 1700 feet above tide water. Along the face of the hill where the picnic ground is located there has been growing, for some seven or more years, a number of peach trees, bearing fruit and free from all leaf-curl or 'yellows.' This ground is about 700 feet above the peach orchards of the valley. It has occurred to me that this may be the cause of their being free from the 'yellows' and leaf-curl. Will you, if not too much engaged, give me your idea on this point? Could it be due to the altitude that these trees are so fresh and free from disease?"

There is no mystery now as to cause of "yellows" in the peach. A parasitic fungus, the spawn of *Agaricus melleus*, feeds on the roots, causing a fermentation of the sap, which, of course, is carried up with the sap and permeates every part of the tree. This *Agaric* gets its start on dead or diseased roots, but soon transfers its work to healthy ones when it gets a chance.

Like all members of the cryptogamic family,—the ordinary mushroom, for example,—it requires nice conditions of air, moisture, temperature and food, to grow vigorously. It is just possible that it would grow with more difficulty in a high altitude than in a lower one; but there are too few facts on record to give a positive opinion on this point.

So far as known there has been no note made of the existence of this root parasite in California. It must have been carried there with some kinds of trees, for it is by no means confined to the peach. This is possibly owing to the conditions in California being unfavorable to its rapid development. It is said there are also localities in the Eastern States where the fungus is not found, and the peach free from disease.

The parasite is particularly partial to old peach stones. In some nurseries it is the practice to bed peach pits and take out the sprouting plants for setting out in the nurseries. Often a quantity will not sprout till the following season. To save these, additional stones are placed in the same old bed, and the root parasite is distributed along with the trees. Careful nurserymen make new beds for their peach stones every year.

The leaf-curl is also the work of a parasitic fungus that attacks the leaf from the outside.

THE OSAGE ORANGE AS A FRUIT.—A correspondent of the London *Journal of Horticulture* brought to England an Osage Orange apple from St. Louis, in 1880. "It had a delicious scent, but was quite uneatable." But this year he got "in the market of Algiers a fruit which I fancied must be an Osage Orange, though the rind of the fruit was smoother than the one we brought from America."

This Algerine production was evidently the Pomelo, as figured and described in the March number of MEEHANS' MONTHLY.

The Editor of the *Journal of Horticulture* adds the following:

"Some years ago a proposal, if not an attempt, seems to have been made to cultivate the tree for its fruit in this country, a rather curious notion, as it is not conceivable that anyone would eat the fruits if they were produced, for, though they are not unpleasantly perfumed, there is no evidence that the native North American Indians ate them. They smeared their spears with the juice before going to war, and made bows, if not arrows, of the wood for shooting their enemies, and hence the tree is popularly called 'bow-wood.'"

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INTENTIONAL SECOND EXPOSURE

Attention is called to this paragraph here in order to ascertain if any one knew just what use has been made of the Osage Orange in America in an edible character.

When the writer of this was a student in Kew over fifty years ago, a small barrel of Osage apples was received,—the writer assisting in opening the barrel. The fragrance was delightful. At that time Sir William Hooker and the young Queen Victoria were passing and were attracted by the sweet odor. Sir William, in his usual pleasant manner, explained what he knew about them,—that they were closely related to mulberry and were good to eat, as the Indians ate them. The Queen slightly bit one, and then with a suspicious smile, remarked, "Sir William?" In a good humored way he responded that he had been credibly informed that the American Indians ate them, but he supposed some method of cooking must have been employed. But ever since this hint, in the long-ago times, the writer has found no confirmatory proof of this.

CRAWFORD'S EARLY PEACH.

The only fact bearing on their actual use came to hand after the war for the Union. The firm had been largely engaged in raising the Osage Orange for hedges. When the war broke out no more seed could be had from the South. At the close, after four years, a promise was made by a Southern gentleman to collect for them; but he was obliged to apologize for the failure in the autumn by the plea that the Osage apples had all been collected and eaten by the freed negro slaves. In some way they must have been in use as food.

PEACH, CRAWFORD'S EARLY.—Among the many newer candidates for public favor, Crawford's Early Peach still retains an honored place. It was raised in New Jersey by William Crawford, of Middletown, over a half century ago, and is valued as among the first of the early peaches to attain a respectable size. The early peaches are usually small. It is not of highest character as compared with others, but yet it may be rated as little inferior to the best. Its hardy, healthy and good-bearing qualities recommend it highly, and to the market man it appeals by its firmness, which enables it to be carried to market well. It is a yellow-flesh free-stone and prettily colored in the centre.

PRINCIPLES OF STRAWBERRY CULTURE.—The finest strawberries (as with all fruits) are produced from vigorous plants; therefore the plants must be set out in such manner and cared for to encourage a strong condition. Single plants or hills will naturally be stronger than plants permitted to make runners and a matted bed. Large, heavy, dark green leaves are usually an indication of vigor and will accompany a fine yield of fruit. Plants grown in matted beds are likely to be later in ripening than those in rows or hills, and will do poorly in fewer years. A good application of manure in the fall and a mulching of clean straw is beneficial. By spring the straw will be mostly well settled among the plants and furnish a clean carpet to the ground and keep the fruit off the soil. The rows should be renewed with good strong plants at the first sign of weakening, which may occur after from two to four years.

NECTARINE FROM THE PEACH.—A Cecil County, Maryland, correspondent sends us the following:

"Pierce Brothers, tobacconists, Virginia Avenue and First Street, have growing in the yard adjoining their store a very peculiar fruit, the name of which does not seem to be known. The tree is a volunteer and resembles that of a peach in its leaf, growth and habits. The fruit, however, is decidedly like a gage in shape, with a tough semi-transparent skin like an apple, green on one side and brown on the other. The seed of this peculiar fruit is exactly like a peach seed and does not adhere to the meat of the fruit. The flavor is that of a peach, but much richer and more delicious. Is it a distinct variety of fruit or a combination brought about by fertilization?"

The fruit sent is simply a peach that has lost its furry coat. It is known in gardening as the nectarine. The original nectarine is recorded as a branch from an ordinary peach tree; but though not common, seedlings from the peach sometimes produce the nectarine fruit, as this has shown it can do.

JUNEBERRIES.—The fruit of the *Amelanchier* has an odd but agreeable flavor, and is cultivated to some extent—doubtless less than it should be. As a rule, plants are set out for the beauty of their flowers, which are produced in great abundance in early spring. There have been attempts at improvement of the fruit, one variety being known as "Success." The report of the Minn. State Experiment Station says of this variety: "It is well worth growing, for it is perfectly hardy, very productive, and the fruit is desirable." Mr. W. F. Bassett, Hammonton, N. J., writes that he has a variety superior to Success, which ripens somewhat later, bushes one to two feet in height being loaded with good-sized berries.

APPLES AND PEACHES FOR SOUTHWESTERN PENNSYLVANIA.—The following apples and peaches are most highly recommended for cultivation in southwestern Pennsylvania:

Apples—Baldwin, Grimes' Golden, Rome Beauty and Winter Rambo. Peaches—Old mixon, Amsden's June and Beer's Smock. The latter is classed in Thomas' "Fruit-Culturist" as identical with Smock Freestone; but nurserymen can show two slightly different fruits, and their claims are backed by the "Catalogue of Fruits" issued by the American Pomological Society. Both are excellent, late varieties.

THE MOUNTAIN ROSE PEACH.—It was recently noted that, for all the many good market peaches introduced during recent years, the two Crawfords—Crawford's Early and Crawford's Late—held their own as special favorites with peach growers over a wide stretch of territory. A correspondent suggests that the Mountain Rose may be added to the list of those that are yet still highly prized by market peach growers.

APPLE, GIDEON.—Minnesota has a hard time in getting hardy apples. The climate is not well suited to the varieties common to our orchards. Attempts to improve on the Russian species, of which the Siberian Crab is a representative, have met with good success. The Gideon is said to be a great advance. The crab strain is not usually of high flavor; but the Gideon is represented as a fine eating apple. In appearance it resembles the Yellow Bellefleur.

WINTER CABBAGE.—Cabbage is easily kept all winter by being buried in the ground head downward. Select the most firm heads, cut off the root smoothly and pack them in piles much as apples, turnips or similar things are treated. When removed, a few leaves may be found spoiled, and it will be necessary to thoroughly cleanse the whole head, tearing off each leaf before boiling the head, as a small brown worm, easily detected, is liable to work its way in amongst the leaves. The flavor is perhaps not quite as fine as when the heads are fresh, but the lover of cabbage will readily excuse this in order to get a right good dish at such a season.

THE COLUMBUS GOOSEBERRY.—It is often a matter for regret that the large English Gooseberries do so poorly in the United States, the foliage mildewing badly, and weakening the whole plant. This trouble is, however, overcome by the use of powdered lime sprinkled on the foliage. The variety tested is the well-known Industry. Another variety for which American parentage is claimed, at least in part, and which seems to do much better, is the Columbus. The fruit produced has the same heavy skin, and is twice the size of ordinary berries. They are perhaps a little less tart, but are nevertheless excellent for preserving and use in pies.

BIOGRAPHY AND LITERATURE.

LIFE'S OCTOBER.

Oh, hearken, hearken ! through the afternoon,
The grey tower sings a strange old tinkling tune,
Sweet, sweet, and sad the toiling year's last breath,
Too satiate of life to strive with death.
And we, too—will it not be soft and kind,
That rest from life, from patience, and from pain,
That rest from bliss we know not when we find,
That rest from love that ne'er the end can gain ?
Hark, how the tune swells, that erewhile did wane !
Look up, love—ah, cling close and never move !
How can I have enough of life and love ?

WILLIAM MORRIS.

PHOTOGRAPHING FLOWERS AND TREES.—All amateur photographers and those, also, who may be considered beyond the amateur point, will find the April number of *The Photo-Miniature* very helpful in the study of plant photography. The subject is taken up exhaustively and the details of execution very clearly expressed. There are so many good points, it is impossible to give our readers much idea of them in this space ; but among them is observed the recommendation of Orthochromatic plates for plant photography in general—Isochromatic plates being the best for yellow flowers. This latter is important, as so many desirable flowers are yellow. This excellent pocket-size magazine is published by Tennant & Ward, 289 Fourth Avenue, New York City.

WILLIAM SAUNDERS.—Few of the eminent lights in American gardening were better known than William Saunders, Chief of the Experiment Grounds of the U. S. Department of Agriculture at Washington—a position he held ever since the Department was organized. His death is announced as having occurred September 12th. He was born at St. Andrew's, in Scotland, on the 7th of December, 1822. A full sketch of his life and services is given, with a portrait, on page 15 of MEEHANS' MONTHLY of the Vol. for 1899. As the designer of the famous grounds of the Gettysburg National Cemetery, aside from other eminent services, his death ranks as a national loss.

HORTICULTURAL HALL, FAIRMOUNT PARK.—Mr. Thomas Mingey, a Kew graduate, for many years gardener in charge of Horticultural Hall, Fairmount Park, Philadelphia, has resigned his position.

ZOE.—The botanical magazine issued as *Zoe*, the publication of which was held back with its fourth volume, has again appeared under the editorship of Mrs. Katharine Brandegee. It keeps the active botanist informed of many matters of interest connected with the flora of the Pacific coast. It is published at San Diego, California.

CHANGE OF NAME FOR THE WINTER ACONITE.—Referring to your note on the change of name in *Eranthis*, in the August MEEHANS', I would say that it hardly seems likely that any great number of botanists will accept changes in the names of plants based upon the authority of "Hill's British Herbal." It has been my fortune to own two copies of this rare volume, and I can say that the book itself bears indubitable evidence that it was written without the slightest reference to the Linnæan idea of giving one specific and one generic name to each plant. Usually there is a string of Latin adjectives to characterize a species, and when there is but one, it is by accident and not intention. No botanist would think of changing the specific name of a plant when it does not agree with the first adjective in Hill's description, and if we cannot accept his authority for species, why do so for genera ?

W. N. C.

That the change would probably have to be made was suggested by a leading botanist, who is regarded as of high authority in such matters.

CHAS. H. BRECK.—Horticulture in America owes largely to Joseph Breck, of Boston. His works on gardening, at the beginning of the last century, were long the standard of reference, and, indeed, his "Book of Flowers" has been re-issued in our own times. Charles Henry Bass Breck, one of his sons, followed closely in his father's footsteps. He took a warm interest in the Massachusetts Horticultural Society, and in many ways exerted a strong influence on the progress of gardening. His death is announced as having occurred at Newton, near Boston, on the 1st of August. He was in his 80th year.

LOUIS MENAND.—The term gardener implied much more a few generations ago than it does to-day. Young men paid heavy premiums to get in as apprentices under learned gardeners, and when at the end of the term they were invested with the "Blue Apron," most of them would compare favorably, in general intelligence, with the graduates of our modern universities. Of these broadly educated men, a notable one, Louis Menand, of Albany, New York, recently passed away in his 93rd year. He was born on August 2, 1807, in the province of Burgundy, France, and maintained his interest in flowers and general affairs till his death on the 15th of August, at his home in Albany.

DAVID F. DAY.—On the 22nd of August died at Buffalo, New York, Mr. David F. Day, who may justly rank among America's greatest botanists. A lawyer by profession and a leading member of the Bar, botany—and, indeed, science and literature generally—was but an incident in his career. His name will not, therefore, appear in the annals of science in company with those who have professional fame, but his work was but little less useful. He was one of the main supporters of Judge Clinton in founding the Buffalo Society of Natural History ; the author of a Flora of the vicinity of Buffalo ; and the general adviser and stimulator of younger men in their work.

In botany and, indeed, in horticulture—for he was devoted to his flower garden—he was far more than a mere lister of plants. He had a broad philosophical interest in them. He loved flowers for the lessons they taught as for the beauty that they gave. He was the discoverer of the law regulating the production of regular and irregular flowers—a question which is yet being mooted in the Old World, where it is not fashionable to recognize New World discoveries in these lines. He had a wide correspondence among the leaders in American science, and his loss will be severely felt.

ORGANOGRAPHY OF PLANTS, by Dr. K. Goebel, Professor of Botany in the University of Munich. Translated from the German, by Prof. Isaac Bayley Balfour, of Edinburg. Part I, General Organography, Oxford ; at the Clarendon Press. New York Branch, 91 5th Avenue.

That this will be a standard botanical textbook need scarcely be stated. Our knowledge of the structure and relations of plants has advanced wonderfully of late years. Progress has been recorded in scattered papers and scientific publications, but a general view of the situation in one authoritative work, handy for general study and class-work, was badly needed. Those who have watched the progress of botany during the past ten years, must have noted the great advance in the knowledge of plant structure and plant life, and how far behind our popular works are. The present work brings the history much nearer our own times.

In one respect there will be a surprise to the intelligent American reader. It has been the belief that the German scientific mind was far in advance of the rest of the world, but far in advance as this great work is, it will be regarded here as scarcely up to date. When the author combats as a prevailing idea "that morphology has nothing to do with the functions of organs has been acquired entirely because the fact has been overlooked that the transformations seen in organs are conditioned on a change of function," it strikes strangely on the American ear. In this country no advanced scholar would think of disputing the necessity of taking in organography, morphology and physiology, as merely essential parts of one great whole.

Even in the Old World, surely knowledge must have advanced further than one would judge from these leading works. Where, for instance, is the necessity for a long chapter to prove that monstrosities have hereditary power,

when every intelligent gardener in the Old World knows that cabbage, cauliflower and many other garden vegetables and fruits are hereditary monstrosities. This weakness of not knowing what is going on among practical men around them, is conspicuous in the work of many great European authors. Even in Mr. Darwin's case he would have lost nothing. He had to assume that mere vegetative vigor and size of seed were proofs of benefits from cross-fertilization. Any intelligent English gardener could surely have told him a different tale. As it is, he has furnished no proof that cross-fertilization is of the slightest benefit to the race. These shortcomings are, however, not peculiar to the present work. It is far in advance of former efforts in this line, and will be a standard for reference in all good botanical libraries.

AMONG THE MUSHROOMS—A guide for beginners. By Ellen M. Dallas and Caroline A. Burgin. A popular work under this title is to be issued the present month (September). The ladies who have undertaken it are members of the Academy of Natural Sciences of Philadelphia, well versed students in the science of mushrooms, and with the advantage not always combined with learned attainments, of presenting the subject accurately in popular and entertaining language. The whole work is a labor of love, looking mainly to the advancement of knowledge in a direction that had many a pleasant path for themselves. In the same line the profits from the work will be devoted to the aid of an institution for children.

LANDSCAPE GARDENER TO FAIRMOUNT PARK, PHILADELPHIA.—The late Wm. Saunders, of Washington, was one of America's eminent landscape gardeners—but he was strictly conscientious, and would be pained to have honors thrust on him that belonged fairly to others. As the public prints say, he was the designer of the very pretty little Hunting Park in Philadelphia, but had nothing to do with the larger Fairmount Park. The designer of East Fairmount Park was John C. Sydney, and the west side was planned in outline by Chief Engineer Cresson, assisted later as "consulting landscape gardener" by Charles H. Miller, who was the first landscape gardener employed on the work—a position he still occupies.

GENERAL NOTES.

ELMS AT NEW HAVEN.—The public prints say that the famous elms of New Haven are failing, and that none of the officials can tell what is the matter with them. In many of our larger cities such matters as trees and parks are placed in charge of the Department of Blind Ignorance. They seldom get famous in these cases. Is it possible that intellectual New Haven is running in the same line ?

HOAKS.—Much wit has been spent at the failure of some Englishmen who cannot help pronouncing oak as "hoak." But it would seem that some of the Indians of the past would have committed the same sin against prosody. In examining a collection of dried plants, made 100 years ago, by Mr. Benj. T. Barton, of Philadelphia, there was found a bunch of elm, with very large leaves, merely marked "Ulmus species, at Tuscarora, 1797." Of the bark of this species, the Indians make a thread. The tree is called by the Tuscarawas "Hoaks."

THE GARDEN OF MRS. SHEPHERD, VENTURA, CALIFORNIA.—Many of our readers are familiar with Mrs. Shepherd through her business dealings. A recent Californian paper describes her garden as a delightful spot. It is at the mouth of Ventura canyon, while the Pacific Ocean is but about 2000 feet from the foot hills among which the town is built.

Mrs. Shepherd's garden lies close up against the foot hills, and is protected on the east by a line of pepper trees, under whose arching boughs lies a walk, bordered with brilliant geraniums. Two hundred feet of heliotrope hedge, six feet high, fills the air with purple fragrance on Main street, and yields, annually, a goodly amount of seed that is shipped east to various seedsmen.

Many beautiful things, only seen generally in greenhouses, thrive here in the open air, the wonderful *Strelitzia* being especially at home. Some plants of this rare curiosity are ten feet high. One of the specialties of her business is the improvement of florists' flowers. Her new cannas and begonias are well known. She has 150 varieties of begonias to experiment with.

ASTER CONCOLOR.

ASTER CONCOLOR.

PURPLE ASTER.

NATURAL ORDER, COMPOSITÆ.

ASTER CONCOLOR, Linnæus.—Stem mostly simple, slender, bearing towards the summit the middle-sized heads in a long—often compound—raceme; leaves lanceolate, silky when young; the lowest ones oblong; scales of the obovoid involucre lanceolate, appressed, the subulate tips spreading; achenes silky. Chapman's *Flora of the Southern United States*. See also Gray's *Flora of the Nothern United States and Synoptical Flora*, Wood's *Class-Book of Botany*, and *Britton and Brown's Illustrated Flora of the Northern United States, Canada and the British Possessions*.

Botanists have estimated that the order Compositæ embraces about one-tenth of all the flowering plants known in the vegetable kingdom. The genus *Aster* has a good share in this preponderance, no less than three hundred and fifty species being now recognized as belonging to it. Though scattered over the four quarters of the globe, of these Dr. Gray, in his *Synoptical Flora*, describes one hundred and thirty as natives of North America. Though nature protests that all these are really Asters, botanists have tried to make at least a dozen genera out of them. But the characters have been thought to be too artificial for a natural system, and these generic names are now used as subsectional only. One of these superseded generic names is *Euaster*, — that is, those which represent the genus more properly than the rest,—true Asters one might say,—and, in this section, our *Aster concolor* appears. In the study of the genus, we may, therefore, take this species as a representative of what a genuine *Aster* ought to be. Chapman, from whom the description here adopted is taken, thus outlines the character:—"Scales of the involucre imbricated in various degrees (see Fig. 2) with herbaceous tips; rays numerous (as seen in the picture); achenia flattened; pappus of soft, capillary bristles not thickened upward; autumnal plants." It is well to remember, therefore, that the poetry that associates the *Aster* with autumnal floral scenery, is sound botanical prose also.

So far as poetry is concerned, *Aster* has not made its mark, to any great extent, in literature. *Aster Amellus*, of Europe, figures in Virgil. In the fourth book of his Georgics, the chapter is devoted to admiration of the work and general character of the bee, with instructions for the care and help from man. He describes their period of life at about five years. They, in time, become feeble, and will deserve some honey to be given them. Dryden thus narrates it:—

"Through reeden pipes convey the golden flood,
To invite the people to their wonted food,
Mix it with thickened juice of sodden wines,
And raisins from the grapes of Psythian vines;
To these add pounded galls, and roses dry,
And, with Cecropian thyme, strong-scented centaury.
A flower there is, that grows in meadow ground,
Amellus called, and easy to be found;
For, from one root, the rising stem bestows
A wood of leaves, and violet-purple boughs:
The flower itself is gorgeous to behold,
And shines on altars like refulgent gold—
Sharp to the taste—by shepherds near the stream
Of Mella found; and thence they gave the name.
Boil this restoring root in generous wine,
And set beside the door, the sickly stock to dine."

It may be noted that, whenever *Aster* is referred to in connection with Old World matters, it is this ancient *Aster Amellus* that is generally referred to.

Many American Asters are dwarf and bushy, as Virgil represents the Italian plant to be; but *Aster concolor* presents anything but "a wood of leaves and boughs." It is a very variable species, and the inflorescence is usually confined to a wand-like stem with the upper portion arranged in racemosely-spicate flowers. The disk, as well as the rays, are

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COLOR PLATE
INTENTIONAL SECOND EXPOSURE

purplish,—a rare circumstance in the *Aster* family, where the disk-flowers are generally yellow. It is from this circumstance that, in English floral literature, it has gained the name of Purple Aster. When it finds itself under favorable conditions, as in garden culture, it is regarded as one of the most desirable ornaments of the flower garden, though not always specially attractive in a wild state. When, however, it takes on a branching character, as frequently seen in New Jersey, from whence the subject of our picture was taken, it has a striking effect.

In modern times, the student sees variation within certain limits in every species of plant. What is called the typical character, is merely the points that happened to be found in the specimens examined by the botanist who named it. Variations subsequently found were anything but welcome; and if the difference was wide, the new departure would be dignified with a separate varietal name, if not, indeed, regarded as a sub-species. Occasionally, they are put forward as "hybrids." Now, the variations are expected and searched for, and instead of the single specimen regarded once as all-sufficient for herbarium specimens, duplicates, in numbers to show the range of variation, are regarded as essential to form a complete collection. Our species is remarkable for its changes of character. In Florida, in the sandy wastes, the leaves are no larger than thyme leaves, and it is surprising that some of the older botanists have not made a "variety *thymifolia*" of it.

In some localities the leaves are nearly an inch long, very narrow, and sharply pointed. In other cases they are much larger than in the one illustrated, and nearly as broad as long. A wide range of variation in branching is also characteristic,—the corymbosely paniculate form common in the New Jersey plants, as herein illustrated, being about the greatest departure in that direction.

The student in plant life will be interested in noting, in the same branch, specimens of centripetal and centrifugal inflorescence. In the spicate forms of flowering, in composite plants, flower buds are formed along the rachis, but, while still young, rest until the terminal bud is reached. When this has expanded, the others open successively downward. These are often used in illustration of the centrifugal style. In this case, that system was followed so far as allowing the terminal flowers to open first; but when the lateral buds resumed growth, the centripetal order followed, and the terminal bud is the last instead of the first to blow.

In studying Asters, fresh specimens are important. Some of most distinctive characters are to be found in the florets by the aid of a pocket lens. In the enlarged drawing, Fig. 4, all the parts are clearly delineated. The obovate akene is downy; the corolla about equal in length to the bristles of the pappus, the tube occupying nearly two-thirds of its length, and the lobes short and obtuse. The column of united anthers, which had been drawn out of the corolla by the expanding lobes of the stigma, has partially descended to a level with the corolla,—it usually takes a couple of days before resuming its normal condition. The style, its apex expanding while still in the staminal column, at length has escaped by sheer mechanical pressure, scooping out with its freedom the mass of pollen from the anthers that so closely enveloped its cloven stigmas, and thus ensuring self-pollination.

The history of *Aster concolor* goes back to the earliest chapters in American botany. It was noted by Clayton, in his collection to Gronovius, in 1742, and was cultivated, by the celebrated Philip Miller, in his physic garden near London, in 1759. These early authors noted especially the purple disk flowers, and that these and the ray florets were of one color; and this evidently suggested the adjective "*concolor*," to Linnæus, when he adopted the binomial plan. According to Dr. Asa Gray, its home is in sandy or gravelly soil, mostly in pine barrens, towards the coast, Rhode Island to Florida and Louisiana. To this, Britton and Brown add Eastern Massachusetts, where, however, it must be very rare. It is not included in the "Flora of Middlesex County," in that State. Pursh was well acquainted with the Jersey form, and has this in mind, doubtless, when he describes *Aster concolor* as "This is one of the handsomest of the American Asters, and highly deserves to be introduced as an ornamental plant."

EXPLANATION OF THE PLATE.—1. Flower-stalk from a New Jersey specimen. 2. Flower-head, slightly enlarged, showing the involucre. 3. Magnified specimen of a complete floret.

WILD FLOWERS AND NATURE.

THE VOICE OF NATURE.

"Ye who love the haunts of nature,
Love the sunshine of the meadow,
Love the shadow of the forest,
Love the wind among the branches,
And the rain-shower and the snow-storm,
And the rushing of great rivers
Through their palisades of pine-trees,
And the thunder in the mountains
Whose innumerable echoes
Flap like eagles in their eyries,—
Listen to these wild traditions,
To this Song of Hiawatha?"

LONGFELLOW.

WANDERINGS OF PLANTS.—I see, in the new October number of the MONTHLY, that you figure that very handsome plant, *Grindelia squarrosa*. You and your readers may like to know that a large and increasing patch of it has maintained itself, for the last five or six years, in Providence. It is on the railroad lands, not very remote from the Union Station.

On these same waste grounds we find several western Artemisias, the wild liquorice (*Glycyrrhiza lepidota*), *Cirsium acanthoides*, *Solanum rostratum*, and many other interesting plants. In the wet portions, not yet filled in, one still sees wild rice, *Zizania aquatica*. Over this whole ballast region, too, the Russian Thistle has spread, while the pretty lettuce, *Lactuca Scariola*, is not only there but all over our city. I found the last also this summer at Gloucester, Mass. WM. WHITMAN BAILEY.

Brown University, Providence, R. I.

THE AMERICAN LOTUS.—In your late number you quote from Longfellow's Evangeline, "And resplendent in beauty the lotus lifted her golden crown above the heads of the boatmen." I have seen the blooms four feet above the water level in the "patch" at Grass Lake. This patch now covers about 100 acres. When I began shooting there about twenty-five years ago, there was not over one-half acre. I have heard Robert Douglas describe a bed south of St. Louis, Mo., that he and Prof. Sargent *drove* through, the flower heads being on a line with their shoulders when sitting in the wagon.

Ducks are reported to be fond of the lotus seed, and I think that, in order to reproduce themselves, Nature gave the plant the strong flower stock, sending the seed pod above the reach of the ducks. A very little frost kills it, and the seed-stem topples over with the apertures downward and under the surface of the water, thus scattering the seed. I have gathered the flowers by the boatload, and a *very few* only were floating on the surface of the water. I have tried to get the "sweet-potato-like" root with a six-foot garden rake tied on the end of an oar, but without success. My experience has been with this one bed; possibly in other beds the flowers float on the water, which is decidedly against the rule in this one. THOMAS H. DOUGLAS.

Waukegan, Ill.

THE AMERICAN LOTUS.—LONGFELLOW VINDICATED.—I am much interested in the articles on the American Nelumbo, in the August number of the MONTHLY. This very beautiful and interesting plant is quite common in the larger ponds and lakes in this vicinity. The bottom lands along the lower Wabash River are usually low and often several miles wide. Numerous bayous, small lakes and ponds are scattered throughout these low lands. During the time of freshets the water spreads into these low bottom lands and runs in rapid currents, and often cuts deep channels in its course across the country. In some instances, the river leaves its original bed entirely and flows through the newly-made channel. This is of frequent occurrence, especially at the mouths of tributary streams, thus forming veritable bayous. In this way, the overflowed lands become cut up by deep, irregular ditches and deserted river-beds, which vary greatly in size and depth. When the river returns to its usual stage, within its banks, these irregular depressions remain filled with water, and are kept so more or less constantly by the rains,

and occasionally they are fed by local springs. These collections of water vary from shallow, muddy wallows, to lakes ten to twenty feet in depth, that are sometimes several miles long. The water is usually stagnant or has a very slow current. During the warm portion of the year these ponds and bayous become a real paradise for aquatic vegetation. The soil and mud are unusually rich, and the vegetation is correspondingly rank; everything grows in luxuriance and abundance. This rank growth makes the struggle for existence intense, and every available foot is occupied by some form

FIG. 1. NELUMBIUM LUTEUM.

of aquatic or hydrophytic growth. In all of this effort for superiority, the American Lotus, *Nelumbo lutea* (*Willd. Pers.*), easily holds its own, and is often the chief survivor—frequently covering many acres of water and mud with its large, peltate leaves and gorgeous flowers; forming large, natural plantations of green vegetable parasols, the glaucous green on the underside of the leaf contrasting in splendid effect with the darker green of the upper surface, when the whole is thrown into slight undulations by a gentle breeze. The day on which the accompanying photographs were taken (August 11th, 1900) I made the following maximum measurements while in the boat: Diameter of leaf, 33 inches; diameter of flower, 12 inches; diameter of top of torus or pod, 7 inches; leaf-stalks were 5½ feet in water and 4⅓ feet above the water line; flower-stalks were 5½ feet in water and 5⅓ feet above the water line.

The flowers open four nights in succession. The first morning they are only partially opened—far enough to give them the appearance of an old-fashioned goblet; when the sun comes out bright and warm, they close. The second morning they are opened wider than the first, yet the petals are well cupped, but usually close by or before noon when the sun shines bright. The third night they open still wider, but close more or less completely during the last half of the day. During the fourth night they open out to the full horizontal line, and during the day usually fall off.

The color also fades from a clear, bright, sulphur yellow of the first day to nearly white when the petals are dropped. During the first days the flowers are deliciously fragrant. I have asked many persons what other odor it resembled, and have almost invariably received as an answer: "Ripe apple," "ripe June apple," and occasionally "spicy." By the same persons, the odor of the Sacred Lotus (*Nelumbo Nelumbo* (L.) Karst.) was given as "spicy" and "like lavender." In regard to the question often asked, How to plant the acorns or fruit? All that is necessary to do is to throw them into the water; if they are ripe and sound they will sink to the bottom and remain there, and if the water is warm they will begin to develop in a short time. If there is no current they will become attached in the muddy bottom, but if disturbed they will be easily detached and float about; the leaflets

being at the surface, and the acorns floating some distance under the surface of the water. August 15, 1900, I threw about fifteen nelumbium acorns into an artificial pond, which is in my door-yard. They fell into water varying in depth from six to twenty inches. By September 11, 1900, eight of these acorns had sprouted and thrown up two leaf-stalks each, one of which in each plantlet had developed a small peltate leaf that had reached the surface of the water. About ten days later the second leaves reached the surface, and a third leaf had grown to be several inches long. The young plants had burst their way out of the acorn at the scar or point where it had been attached to the receptacle — just the reverse from where it occurs in the acorn of the oak. The young stems started at the pistil end of the fruit and passed down between the two halves or cotyledons of the acorn. The young stems were about one and one-half inches long, and the leaves had started to develop at the upper or outer end. The plants that I had pulled up, for examination, did not sink to the bottom when thrown back into the water, but instead floated about; the small leaves remained at the surface, while the acorns floated several inches under water.

FIG. 2. NELUMBIUM LUTEUM.
(Reduced two-thirds.)

But the main object in writing this note is to vindicate Mr. Longfellow's statement in Evangeline:

"Water-lilies in myriads rocked on the slight undulations
Made by the passing oars, and, resplendent in beauty, the lotus
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By examining carefully you will find, in figure No. 1, a man sitting in a boat, while the flowers about him are more than a foot higher that his head; you may also catch a glimpse of his boat just in front of him. Figure No. 2 is a flower in bloom on the third day; it is one-third natural size; it was a little over one foot across.

J SCHNECK.

Mt. Carmel, Ill.

SQUIRRELS AND GREEN FRUIT.—The writer did not know the extent to which squirrels would feed on buds and barks until attention had been called to it by Mr. Egan, of Egandale, Ill. Recently Mr. Egan has noticed that they will climb up Canna stems, and feed on the buds.

On the grounds of the Meehan Nurseries, they have this season been feasting on the half-grown acorns of the Red Oak. Creatures soon learn to avoid starvation when some favorite food is not at hand.

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INTENTIONAL SECOND EXPOSURE

GENERAL GARDENING.

THE SUN AND SKY.

" The elements and seasons, as they change,
Do find a worthy fellow-laborer there —
Man free, man working for himself, with choice
Of time, and place and object."

WORDSWORTH.

SALISBURIA ADIANTIFOLIA. — Last year I read, in a certain floral magazine, an article written evidently in response to an inquiry made in a previous issue of the magazine in question relative to the germinating qualities of *Salisburia* seed in which the writer said, "The seeds of this shrub do not mature in this country," and said something to the effect that the climate of the United States was not congenial to their perfect maturity. As I doubted this assertion, I gathered some seeds from the ground beneath a fine specimen on this place, late in October, and, after removing the pulp from them, placed them in a cool, frost-proof place, and this March planted them (after cutting carefully through the very hard shell), with the result that *four* out of five grew and are to-day six inches high. I send you, under separate cover, full proof of what I assert in the shape of one of the plants raised Trust you will find space for this correction of a somewhat prevalent idea as to the maturity of these seeds.

Would it not be conferring an honor on the flower and tree-loving public if each contributor to any public magazine realized how many people gain all the information they have from these sources, and that they (the writers, I mean) should have ample proof of their assertions in a tangible—not theoretical—form before committing themselves, to submitting their opinions to the public eye through any channel? A. P.

Rahway, N. J.

There are three forms of this tree—some individuals being wholly male, others female, and others with flowers of both sexes on the same tree. For a long time only the male tree was known, and these, of course, were barren. It is possible the writer had these barren trees in mind,—but the use of the expression "do not mature" was misleading.

But this varying from exact facts is unfortunate, as our correspondent well suggests. But it is as common in high quarters as in the lower ones. Mr. Darwin, in one of his works, refers to a paper on trees by Mr. Meehan "all growing in his garden." The garden at that time was but newly established; and the English translation of Sach's "Text Book of Botany" quotes Mr. Meehan as saying that the seeds of the Wild Blackberry, *Rubus villosus*, never germinate in America! These lapses are very common, especially in high class magazines.

TREE ENEMIES.—A Buffalo correspondent says: — "Between borers, scale, Elm-leaf Beetle, Tussock Moth, 'bacteria,' etc., there seems to be sufficient work for a tree inspector with a staff of assistants for each large city. This beautiful city, for instance, would lose much of its attractiveness, comfort and healthfulness by the loss of its beautiful trees."

So far as the troubles that surround the cultivator are concerned, it is probable they are about the same as they ever were. The only difference is that intercourse between distant regions of the earth is closer now than ever before, and man's attendant evils travel with him. Weeds and insects appear in localities where they were unknown before. The food they require is abundant and they increase and multiply in proportion to this abundance. As we find it in the visible world, so with the invisible or microscopic world. The atmosphere is a fluid, and floating with the current are minute organisms, plant and animal, propagating themselves as in more visible cases. All at once, some one kind finds out a locality to its liking, the spores germinate, and a new colony is founded. Of these minute fungi, some forty thousand species have been known and described. As with larger plants, most are beneficial to man, a few are enemies. So with these minute organisms, a limited number are parasites and destructive to that which they prey upon. But this accounts for the appearance of plant diseases and insects where not known before.

Fortunately, the discovery that chewing insects can be destroyed by Paris Green, sucking insects by kerosene emulsions, and fungus parasites by copper solutions, has given us weapons equal at least to the powers of the enemy. All we require now is the generally diffused intelligence to use them properly. As for help from municipal bodies, that is out of the question; when the blind lead the blind, both fall into the ditch.

THE TURKEY OAK. — England has good cause to be proud of the Royal Oak, *Quercus Robur*. Spain, also, would lose much of its commercial standing without its Cork Oak, *Quercus Suber*; while the Oak-galls of *Quercus coccifera* help the commerce of the Mediterranean region. The Turkey Oak, *Quercus Cerris*, of Eastern Europe, is also an essential part of a fine forest of timber. Outside of these, the American continent and Japan are the chief homes of the oak.

TURKEY OAK.

One special feature of great beauty is the lovely tints the oaks of the American continent assume in the fall of the year. The Turkey Oak, however, of which we append an illustration of a thirty-year-old tree, is nearing Asia in the countries wherein it is found wild, and assumes a slightly golden tint in autumn. Its acorns are striking by reason of the mossy character of its cup. Its habit is rather of the low-spreading type,—and it has an interesting appearance in the landscape.

VITALITY OF SEEDS.—The belief that seeds will live an indefinite time under ground, and germinate when under normal conditions, has been disputed by careful judges,—not because the negative had been demonstrated, but because the facts presented in favor of the notion were not of the character to admit of doubt. Little by little, direct evidence has been obtained, and there is no longer room for doubt. Seeds may live for an indefinite time when deeply covered by earth.

One of the most valuable contributions to our knowledge has recently been made by Prof. W. J. Beal. He buried seeds of 22 species of plants three feet below the surface, in bottles, in 1879. Recently, after 20 years, the seeds were planted. The details are given in the Proceedings of the Columbus (Ohio) Horticultural Society for 1899. A large number grew, — and Dr. Beal is not prepared to say that those that did not grow were bad, as those that did grow came up irregularly.

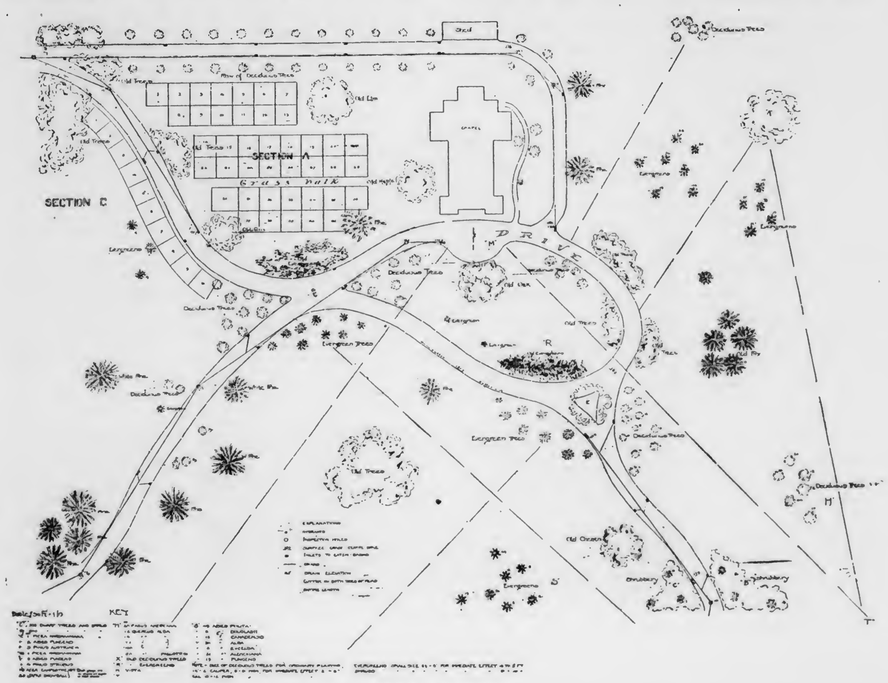
To our mind, bisecting a seed and examining with a lens is a much better test of the soundness of the seed than waiting on the process of germination. All nurserymen know that seeds unquestionably sound will, at times, fail to grow, from some unfavorable circumstances unknown to the sower,—and that some will have better success with old seeds than others with new, though all may be regarded as experts. The practical nurseryman tests his seeds at once by bisection, and accepts or rejects the samples accordingly. This would be a better test in experiments on seed-longevity.

ELM-LEAF BEETLE.—In reply to your correspondent, F., I wish to confirm what he says

in regard to the freedom, the past summer, of the elm trees, including the English Elms, from the ravages of the Elm-tree Beetle, and I am glad that you give the so-called English sparrows some credit in the matter.

Tivoli-on-Hudson. S.

LANDSCAPE GARDENING IN CEMETERIES.—The arrangement of the landscape in connection with modern cemeteries is more and more resembling ideas followed by park landscape gardeners. Appreciation of good landscape effects, of course, varies according to its connections; but the reposeful beauty of a well-laid-out cemetery is almost as attractive as any other piece of artificial scenery.



CEMETERY PLAN.

The accompanying illustration of a plan of a portion of the grounds of a suburban cemetery, plans for which were prepared by Thomas Meehan & Sons, shows how by early arrangement the lots for burial are made to fit in with the surrounding landscape, and are in a measure secondary to the general plan. The first idea is to form a beautiful resting-place for the burial of the dead.

The portion shown in the upper part of the plan is high, the ground sloping towards the foot of the plan, which accounts for the manner in which the driveways lead. Where the latter intersect, good opportunities are afforded to group trees and shrubs.

The chapel outlined on the hill is naturally a central figure, and in the planting has been permitted to show through several long vistas. The planting arrangement of a large piece of ground requires the exercise of considerable judgment. An expansive stretch of lawn must be preserved, yet properly margined and slightly broken by groups and a few specimen trees to take away its bareness. Buildings or distant views need not always be required for vistas; fine old specimen trees, a particular group or rare and beautiful specimens may be chosen.

PIN OAK, QUERCUS PALUSTRIS.—The beautiful avenues of Pin Oaks in Fairmount Park, Philadelphia, have often been mentioned in terms of praise, and well they deserve it, for besides their great beauty, what other tree could be used to produce a like scene? But beautiful as these avenues are, it is not alone for this purpose this oak can be used. Have many of your readers living near Philadelphia seen the wild specimens of this tree in the vicinity of Paschal in the lower part of the city? A few years ago there were specimens there worth going miles to see. Not massive trees, but trees in vigorous youth, as regular in outline as though they had been under a skilled grower for years. This is the natural habit of growth, and in this respect it stands alone amidst all others of this worthy genus. When permitted to develop as it desires, the branches for many feet up grow downwards, giving to such a tree an almost drooping character. There are, or were, numerous specimens of these well developed trees, in the locality named, a few years ago, objects of much interest to lovers of rare beauties.

Some years ago there was an avenue of this oak on the grounds of the late Charles A. Dana, Glen Cove, Long Island. Mr. William Falconer, who was in charge at that time, had interlaced the branches from each side of the road, in just what way I do not recall, but the effect was to form an archway of green along the drive.

The coloring of the foliage of oaks is always watched with interest in autumn. Some persons think a dry autumn more favorable than a wet one, and others, the opposite. I have never been able to satisfy myself which side is the right one, but I do know that the Pin Oak is one of the best for autumn beauty. It is perhaps never the equal of the Scarlet, but I would not say it is not often the equal of the Red. Add to this the many good points it has, such as the drooping habit, lustrous, much-divided leaves, beautiful habit of growth and ease of transplanting, and then the Pin Oak stands at the head of the list.

JOSEPH MEEHAN.

THE GIANT TREE OF CALIFORNIA.—The giant tree of California, *Sequoia gigantea*, does not thrive in the Eastern portion of the United States. A parasitic fungus, *Cercospora Sequoiæ*, follows the seeds and plants from its native home, and before the seedlings reach their second year are mostly dead. Larger trees, imported directly from California, bring the fungus with them. The parasite seems much more destructive under the new conditions than in its native home. Though many have been planted within the last half century, there is no record of a fine tree anywhere. The English climate seems more favorable to the repression of the fungus, and there are many fine specimens in the gardens of that country, as well as in adjacent territories outside of Great Britain. *The Gardeners' Chronicle* of June 16th figures a fine specimen on the grounds of Wrest Park, the county seat of the late Earl de Grey:

"It is said to have been planted by the late Mr. Snow in 1856, and must therefore have been one of the first introduced into this country. It is now a fine tree, with branches that sweep the ground at its base. Here are the exact measurements: height, 74 feet 3 inches; girth at ground level, 21 feet 3 inches; and at 3 feet from the ground, 15 feet 3 inches; the branches extend from north to south 36 feet, and from east to west 35 feet."

AMERICAN FORESTRY.—American forestry has not yet gone beyond the preservation of our old forests, for general reasons. Tree culture for profit, which forestry signifies in the Old World, is here not thought of,—nor will it be while we have forests to burn. In the Old World, forestry is a business. The artificial, hand-made forests of France, and especially Germany, supply most of the timber used in those countries. England depends on outside sources almost wholly for its timber. England paid about ten millions of dollars for foreign timber last year. Her bill is annually growing larger. But it is slow work to make a profit on timber planting. Thirty-five years is long to wait.

THE AUSTRIAN PINE.—In landscape gardening light, graceful, feathery-sprayed trees and shrubs play an important part,—but there are situations that require trees of a heavy, massive character to yield the best effects. Among evergreens, the Austrian Pine is of this monarchial race. For grandeur and majesty, few other species of pine can approach it. It is a

rapid grower,—and, unlike most rapid growers, maintains its royal beauty to the last. The specimen illustrated is about 10 or 12 feet high, and has been about that many years planted on the grounds of David Pepper, Esq., of Chestnut Hill, Penna.

PRUNING.—One of the greatest of all arts, in gardening, is that of pruning,—but it is fast becoming a lost art. Even many who rail against the tree butchers who behead street and park trees in order to get a meal or two in the winter time, could scarcely give a rational answer to the question how to prune. The peculiarity of the art of pruning is that it cannot be taught by books. No one can prune intelligently without some knowledge of the general laws of plant life. These general laws may be understood by one who thoroughly loves a plant, and who watches its growth day by day, though such a plant-lover might not be able to put in language the laws revealed to him. The much abused "old woman" will often present a plant perfect as a specimen, made so by judicious pinching of the branches, that would put the work of a learned Professor of gardening to shame.

AUSTRIAN PINE.

The decline of the art is much to be regretted, in the evidences everywhere around, of trees and plants spoiled by ignorance of pruning.

NATURALIZING PLANTS. — A correspondent asks: "Would not Himalayan, Andean and Thibetan trees thrive with us? Is it true that the real European woodruff grows wild in our country? I have found this stated three or four times in newspapers. I have the plant growing in my garden, but it came from European seed."

EDUCATED GARDENERS —Since the old system of garden apprenticeship has been abrogated, some horticultural schools and other institutions have examinations and give certificates to those who successfully pass them. The London Royal Horticultural Society is doing good work in this line. In April, in each year, they have examinations open to all. The questions are such that any first-class gardener should be able to answer promptly and on the spot. At the last examination, there were 236 candidates. Three hundred were taken as high water mark, and only those who received 200 points and upwards received first-class certificates. Of these, 141 were successful. Only one candidate secured the full 300. This was a lady—Miss E. W. Winlo, from the Horticultural College at Swanley, in Kent. It may be noted here that women are becoming numerous in the horticultural field in the Old World. Of the 141 who received certificates that they were experts in horticultural knowledge, no less than 38 were women.

NEW OR RARE PLANTS.

THE ODOR OF THE KUDZU VINE. — The Kudzu Vine, which has become so valuable in rapidly covering trellises, pillars, and buildings, has been esteemed mainly on this account. Its growth of over a hundred feet in a single season is truly amazing. It was distributed as *Dolichos Japonica*, though it is now said its proper baptismal name is *Pachyrhizus Thunbergianus*, derived from its enormous roots. It appears that where the plant has become strongly established, all the branches of the past year do not die back to the ground. From these enduring stems, spikes of bright purple, bean-like flowers issue. They are so hidden by the foliage as to be unobserved, but soon make themselves known by a delightful odor that is wafted to long distances around.

THE HARDY ORANGE.—The Hardy Orange, *Citrus trifoliata*, proves to be one of the brightest fall ornaments of the garden. One may use the term brightest in its literal sense, for when covered with its small, golden oranges, it is a sight well worth seeing. We read of the glories of the Nile-tropics, but they are beyond reading about when as object lessons they are brought to our Northern doors. The plants seem to have their own notions about transplanting,—at times going right on without seeming to object to their moving in the slightest degree,—at other times standing almost the whole season without a leaf, or even dying. But it is one of the arts of gardening to discover what is needed by various classes of plants,—and this will be no exception as time passes.

THE HARDY FLOWER GARDEN.

WINTER CARE OF TEA ROSES.—It must be distinctly understood that this variety is very tender, requiring, probably, a little more care and attention than the amateur feels disposed to bestow upon them; although they will amply repay for the time and the labor that is necessary for their protection through the winter months.

The following varieties I have grown and wintered out-doors: "Catharine Mermet," "Madam Cochet," "Jean Ducher," "Marie Van Houtte," "Madame Lambard."

In the first place, secure good, strong, two-year-old plants (I prefer budded stock), select a sheltered situation facing south, and in planting, see that the bud (or the place where the bud is inserted in the Manetti stock), is about three inches under the ground. If any pruning is required, do it sparingly. Towards the end of November, or as soon as winter sets in, tie up the bush to a stake and bank up the roots with cow manure and leaves; take a nail-keg, knock out the bottom, and bore three or four holes in the side, about midway, for ventilation; place it so that the bush is in the centre and fill in thoroughly with dried leaves. Do not pack too tightly, or mildew will follow; let the stake project above the keg from four to six inches, and this will act as a centre pole. Then take a piece of factory, or anything of that nature, cover the keg so as to assume the shape of a military tent, and tack the factory (or whatever is used) to the top edge of the keg, so as to be thoroughly waterproof.

It must be thoroughly understood that the secret of protecting "Tea" roses is to keep them dry, especially towards spring. Another point, which cannot be too strongly emphasized, is this: it is the warm days and freezing nights in the spring that prove so disastrous to the rose; hence the necessity of keeping them covered until all appearance of frost is gone.

J. G. JACKSON.

Port Hope, Canada.

In *Canadian Horticulturist.*

THE BLUE EUPATORIUM, E. CŒLESTINUM.—There is an abundance of hardy, fall-flowering plants with yellow flowers; but other colors are not well represented. On this account, especially, is the *Eupatorium cœlestinum* a very desirable plant. But it is also interesting in many ways. In flower, it is beautiful, a bed or long border strip of it showing to great advantage. It is a fair rival, in some respects, to the ageratum, having the great advantage of being perfectly hardy and the flowers a bright blue. It is dwarf, and likes moist places as well as thriving in dry soils. The flowers last at least six weeks.

FRUITS AND VEGETABLES.

FIGS AT THE NORTH.—A correspondent inquires how far north the fig will mature in the open air? There seems no reason why the fruit will not mature to an indefinite distance northwardly. It is rather a question of the protection of the trees from injury in the winter, than of ripening the fruit. The wood is usually killed to the ground north of the Potomac, but the branches are easily protected

by bending down, and covering with earth, as is often done with raspberries, roses, and other things. It is very easily done. In the vicinity of Philadelphia, trees bear profusely this way, and are among the most satisfactory of fruits in an amateur's garden. They bear several crops a year, and some can generally be had from the trees at any time during the season—One of our subscribers, Mr. Theo. W. Rand, of Radnor, Pa., has gathered, the past season, from a few trees in his garden that have this form of winter protection, more than six pounds of figs at a single gathering.

THE CHINESE MARKET GARDENER.—A correspondent of an English paper, writing from an English colony, sends the following account of experience with Chinese gardeners, which is much like American experience on the Pacific coast :

"The Chinaman is the finest market gardener in the world. He will take an arid patch of land, whose chief characteristic would appear to be rocks and gravel, and in a few months will have transformed this into a flourishing garden. This is partly owing to his indomitable industry, and partly to his exceeding ingenuity. If he excels in reclaiming waste spaces, he stands on a far higher pinnacle still when it comes to selling his produce. In starting business as a gardener, the Chinaman will always look out for a partner before commencing work. This is the first step. The second is to obtain the tools and seeds without paying out the cash for them, because it is against a Chinaman's religion to pay money away if it can possibly be avoided. The way he goes to work is as follows :—He will go over to the neighbouring store, and will interview the storekeeper. It is a strange commentary on our boasted civilization that in the colonies the storekeeper will more readily trust a Chinaman than he will an European ; but such is the case. This is because a Chinaman has never been known to fail in any project he took in hand ; also because the Celestial will settle down where he first strikes until he has made sufficient to return to live in luxury in his native land, or is carted back there in his coffin. Once they have obtained the tools and the seeds, the partners will start getting the land into order and planting it. When this has been accomplished, they will turn their attention to their own immediate wants, and will fix themselves up a shanty. They will fashion a rude table and a few chairs out of empty cases, which they will wheedle the storekeeper into giving them, and will rig up a couple of bunks alongside the wall, and will then be settled. Until he has got his land into going order, the Chinaman will live with the nearest of his compatriots. Once the crops are up, one of the partners will do the selling, whilst the other attends to the garden. The Chinese hawker will start away every morning for the town, his baskets—for he carries two suspended on either end of a long pole, which he balances on his shoulders, will be filled to overflowing, and he will call at door to door until he disposes of his load. He will sell 50 per cent., below the price his European confrères charge, but he will make more out of his goods than they will. After a time when his circumstances improve, he will invest in a cart and a wretched, half-starved pony or donkey, and will take a larger supply into town every morning ; he will also take over more land, and will extend his fence, and will put up a notice that 'Ah Lun sells vegetables cheaper than any other gardener in the district,' and the European gardeners in the neighborhood, should there be any such, will gnash their teeth and talk moodily ; but before long they will bow to the inevitable, and seek some other clime where the heathen Chinee is unknown."

COFFEE.—While politicians and military men are puzzling over what may be done to advance these interests in our newly-acquired Spanish possessions, it behooves the cultivator of the soil to note what may be done to aid progress in the more material wants of man. We have been able to grow nearly all sub-tropical fruits and useful vegetable products within our territories, but none of our borders have reached the coffee growing line. When 20° north latitude is reached, however, coffee growing is a success, subject, of course, to the freedom from insects, mildews, and moulds, which seem such serious pests in the coffee grove. The West Indian Islands and the Philippines are within the nature-bounded lines. Coffee has been one of the staple products for a hundred years or more,—but it is believed much may be done by American brains and American enterprise to conquer the coffee enemies, and to render the product more profitable.

The native country of the coffee is not positively known. It is believed to have been brought across the Red Sea from Africa to Arabia, many centuries ago,—and that the Mountains of the Moon may have been its original home. It became popular since Mahomet's time, and to the Arabian Mahomedans, we are chiefly indebted for the distribution of the coffee plant over the civilized world. In Tropical Africa, however, where the coffee plant, as we know it, has become a sort of weed, there are a number of species that have not yet been tested, with possibly one species known as *Coffea Liberica*. It was brought into notice, at the American Centennial among the African products. It seems to be free from the troubles that worry the cultivator with the old *Coffea Arabica*, and is in every way far more robust and productive. The annexed cut will give some idea. It is said that twelve pounds of clean coffee berries can be obtained from a five-year-old tree. When our new possessions become settled, it will be well worth a trial by the coffee grower.

COFFEE.

RUSSIAN APPLES AND JAPANESE PLUMS IN IOWA.—Prof. John Graig, writing in *Gardening*, says "The Silken Leaf, Hibernal, Recumbent and others of this type are among the hardiest and most productive of the Russian apples. They are undoubtedly valuable in Northern Iowa, Minnesota and probably Montana, where apples are grown with difficulty. Silken Leaf can only be eaten with comfort and satisfaction when cooked and properly seasoned.

The Japanese plums do not, as a rule, succeed in the Upper Mississippi Valley, not so much on account of inability to withstand cold, but owing to a general inadaptability to climate. This manifests itself in various ways. The leaves are unduly susceptible to 'shot-hole fungus' (*Septoria*), the trees are attacked by black-knot, while the fruit in this dry climate rots in a most unaccountable way. In Iowa, the Japs *per se* have not proved successful. They do far better in the East."

STONE FRUITS ON AN ALMOND BUSH.—Correspondents often befriend us by sending newspaper slips with extraordinary garden news therein. Thus the following comes to hand :—"There is a man, in Maryland, who has a plum tree on which he expects to grow, besides plums, peaches, almonds, apricots and nectarines. He sawed the top off the plum tree and grafted on an almond branch, on which he has now budded peaches, apricots and nectarines."

Any of these fruits will graft successfully on the almond stock, and might be found all on one almond tree as here detailed. Such combinations do not generally succeed perma-

nently, as the most vigorous growers draw a large part of the food and starve the weaker ones.

ABNORMAL SECKEL PEARS.—Mrs. Susanna Gaskel, Swathmore, Pa., sends samples of Seckel Pear that have become apples, so far as form is concerned. They are flattened, or, as the describer would say, oblate, and in some cases the stem end is sunken as in the apple and not drawn out, as in the pear. About one-tenth of the whole crop behaves in this way. Not far off is a russett apple tree,—and with much more apparent reason than is usually advanced in these cases, she believes that bees fertilized the pear flowers with pollen from the apple tree.

The pears are certainly very remarkable. We shall, however, have to excuse the bees. It is a fair inference that if they were capable of bringing this about now we should have had the evidence years ago,—and in every body's orchard where several varieties of apples and pears are grown near each other. The apples also should produce pears from the pear tree pollen, the bees working both ways.

But aside from this argument from a logical standpoint, is the fact that careful experiments have failed to find any evidence of change in the seed-envelopes of hybrid plants. The seed is affected, but not the carpellary structures. That the seed is affected is well-known by the illustration in Indian corn,—but the seed is a new product arising directly from the pollen and we might expect it to be under its immediate influence.

This case of the Seckel Pear would be referred to what is termed bud-variation. The case of a nectarine springing from a branch of a peach is another instance,—and many of our finest roses and other things have originated in this way. These sports are found to have a hereditary character equal to plants raised from seed,—and grafts from the branches bearing these abnormal pears, would result in securing a new and very interesting variety.

LOCATING A KANSAS PEACH ORCHARD.—A writer in the *Western Fruit Grower* gives the following advice regarding the location of peach orchards in Kansas:—"One thing to avoid on the prairies of Kansas is too rich a soil. I learn that, in some counties of Western Kansas, the peach is successfully competing with the forest tree as a wind-break, so rapidly does it grow; a growth of eleven feet in one year has come under my observation. Let us be particular about soil and location. Take the highest points possible, upland clay or sandy loam; no bottom land or wet land is desirable. It is especially desirable to take a north slope. A few good varieties may be named: Early Rivers, Elberta, Oldmixon, Smock, Picketts, Salway, Heath and Wilken's Cling."

THE "LOGAN BERRY."—Occasion was taken, recently, to note that what was sent out as the "Logan berry," was really a blackberry, and a sport from the wild blackberry of California, *Rubus ursinus*. A Californian correspondent states that it is a variety of this wild blackberry or, as he says, "dewberry crossed with the Hudson River Antwerp." But the latter portion of the paragraph is incorrect. There is no reason for the statement that the raspberry had anything to do with it.

PROTECTING ORANGE ORCHARDS.—Not only in Florida, but in California, orange orchards or groves are liable to injury from frost, and experiments of various kinds are being made to protect them. At the famous Riverside, in California, the thermometer falls at times to freezing point. For protection, a grower at that place constructed a hot-water boiler, at a cost of $200, to run hot-water along open furrows. The water passed from the boiler at 85° when the outside temperature was 32°, the earth at 666 feet from the boiler was found to be 36°, and the vapor arising from the warmed earth, protected the plants.

APPLES IN THE WEST.—Kansans have concluded that apple culture, after all, is one of the most certain of paying crops for that State. One land-owner set out 160 acres of apple trees last spring, and intends to increase the patch to 500 acres. It does not seem the "Drouthy Kansas" it was once reputed to be.

BUTTERCOURT ORANGE.—A correspondent of the *Florida Farmer* says that the variety of orange, known as the Buttercourt, seems one of the most productive. It was raised originally by Thomas Rivers, an eminent fruit grower of England.

BIOGRAPHY AND LITERATURE.

THE MOUNTAIN PEAK.

Where the bleak Swiss their stormy mansion tread,
And force a churlish soil for scanty bread;
No product here the barren hills afford,
But man and steel, the soldier and his sword.

No vernal blooms their torpid rocks array,
But winter lingering chills the lap of May;
No zephyr fondly sues the mountain's breast,
But meteors glare, and stormy glooms invest.

Yet still, even here, content can spread a charm,
Redress the clime, and all its rage disarm.

OLIVER GOLDSMITH.

SUCCOTASH.—Prof. Millspaugh tells the *Chautauquan* that the dish made from the kernels of corn stripped from the cob and boiled with beans, and known as Succotash, originated with the Indians, who called it Msickquatash, from which our name Succotash is clearly derived. We give the orthography as printed in the *Chautauquan* without knowing what the *M* represents, or how with it the full name would be pronounced.

POISON SUMACHS.—In the U. S. Year Book of Agriculture for 1896, p. 139, there is an elaborate, but by no means exhaustive, article on the poisonous plants of the United States. The writer mentions *Rhus radicans*, *R. diversiloba*, of the Pacific States; *R. Vernix*, our common Poison Dogwood, and *R. Michauxii*, of North Carolina. The exceedingly poisonous *R. Metopium* of Florida is not mentioned. The poisonous species of *Sophora*, *Astragalus*, *Hosackia*, *Oxytropis*, and the other low-weeds, are conspicuous by their absence. *Gelsemium* is not included. The aconites and other ranunculaceous poison plants are omitted. Our suspicious plants of the moon-seed family are not mentioned. Not one ericaceous plant is alluded to. It would not be difficult, I think, to find the names of a hundred poisonous North American plants which are not mentioned in this article. So much for a sample of book-making perfunctorily done and paid for by a long-suffering people, to be given away by congressmen who neither know nor care what becomes of the volumes after their distribution. B.

FLOWERS ON TOMBS.—In Turkey and certain parts of Asia, where Mohammedans abound, a Mussulman's grave is never opened again in any case. In order to avoid the least attempt, the graves are huddled together, and immediately after the funeral, a Cypress is planted on the grave, so that their cemeteries resemble a sort of forest. In the Island of Jimor, funerals are often retarded through the necessity of collecting funds for the funeral fête. As soon as the grave is filled up, a young Palm is planted.

The custom of floral and plant offerings, in homage to the dead, has been general from time immemorial. The Ancient Greeks not only strewed flowers over the grave, but also planted asphodel and mallow, because the seeds of these plants were supposed to serve as food for the dead. Romans, like the Greeks, attributed a special value to the rose as a funeral flower, and left instructions that after death their graves be planted with the favorite flower. At the present day, in Wales, white roses are placed on graves of young girls. Chinese plant roses, anemones and a species of licorice on their graves. The people of Madagascar have a species of Mimosa which is frequently found planted on the hillocks of their cemeteries. *La Semaine Horticole.*

Translated by S. D. LANNING.

THE CENTURY BOOK OF GARDENING.—Edited by E. T. Cook. Published by "Country Life," London, and by Doubleday, Page & Co., 34 Union Square, New York.

To say that this is a beautiful book, and as useful as beautiful, is but faint praise. It is a volume of 600 pages, in a volume but slightly smaller than a volume of the Century Diction-

ary, with finely calendered paper, clear type and with admirable illustrations on almost every page. These illustrations represent scenes from many of the grand old gardens of England, flowers, fruits and vegetables,—in short the successful aim has been to give every branch of gardening. All the popular flowers grown in gardens are fully described, as are all the practises employed in general gardening. It is, indeed, to gardening, what the Century Dictionary is to general intelligence,—and will be an invaluable book of reference for a long time to come. Being a work founded on English gardening, it might be supposed not applicable to gardening in our country. In some respects this is true. The calendar of operations for every month in the year, for instance, would hardly suit an American garden, but making allowances for all differences on this account, there is no American gardening library that would not find it invaluable.

HEDGES, WINDBREAKS, SHELTERS AND LIVE FENCES, BY E. P. POWELL, NEW YORK, ORANGE JUDD CO.—Live fences, for agricultural purposes, have not been found as cheap or generally useful as artificial fences, and profit is the main element in agricultural pursuits. But in horticulture which deals rather with comfort and pleasure, hedges and ornamental tree planting are essential elements. The poorest home may be made attractive at a small expense, and, as the author of this little book shows, innumerable farms may have beauty at a cheap rate by a little knowledge what best to do. This is the object, and the prolific instruction, plainly given, and beautifully illustrated by pictures, will do much to help along the good work.

EDUCATION IN JAPAN.—Japan is fast modeling itself after American institutions. A late census of public school children places the number at 4,168,000, and it is now proposed to have an "arbor day" for their benefit. Japanese papers propose May 10th for the arbor day celebration.

The idea of setting apart one day in the year especially for the purpose of impressing the popular mind with the value and importance of trees and tree culture, originated with ex-Gov. Sterling Morton, of Nebraska. He must be proud of the success of his "Arbor Day."

GENERAL NOTES.

A LARGE EMPRESS TREE.—Probably the largest specimen Empress Tree—*Paulownia imperialis*—in America, is in Independence Square, Philadelphia. It is one of the first lot introduced into America about fifty years ago, and was a gift to the city by the late Robert Buist, one of America's famous nurserymen. It is now eleven feet in circumference, equalling in girth some of the old American Elms that were in the plot before the Revolution. The wood is in great demand in Japan. It is light and strong. When American forests disappear, and the planting for timber becomes a flourishing branch of agriculture, the Empress Tree will give a very good account of herself.

RAPID GROWTH OF A SILVER MAPLE.—A Silver Maple—*Acer dasycarpum*—which has proved such a failure as an ornamental street tree where the roads are comparatively narrow, has considerable value in special lines for its timber. It is one of the most rapid of growers. Near Philadelphia, one had to be cut down recently to make way for building improvements. It was less than 40 years' old, was from self-sown seed, and never transplanted. It measured 10 feet 9 inches in girth, three feet from the ground. It had not been crowded by other trees, and all its surroundings were favorable.

NAMES OF PLANTS AND FRUITS.—Pomologists, like botanists, find it impossible to enforce the rules of priority in names of fruits and flowers. In fruits, the names of Bartlett for a pear, and Telegraph for a grape, have not been changed in spite of the efforts of leading Pomologists and Pomological Societies to support prior names. Those who lead in these good efforts forget that the only law for language is the law of custom. In a famous grammar, we are told "the English Language requires the pronoun *it* for all inanimate objects; but custom has so firmly made the sun a he, and the moon a she, that we have to accept it." Thus it will ever be. To secure the adoption of a prior name, reformers must bestir themselves, before custom gets possession of the field.

GAILLARDIA ARISTATA.

AWNED BLANKET-FLOWER.

NATURAL ORDER, COMPOSITÆ.

GAILLARDIA ARISTATA, Pursh. More or less hirsute, often two or more feet high; leaves lanceolate or broader, or lower ones spatulate, from entire to laciniate-dentate or sinuate-pinnatifid; rays in the largest heads one-and-a-half inches long; lobes of disk-corolla subulate-acute and tipped with a cusp; pappus aristate. Coulter's *Manual of Rocky Mountain Botany*. See also *Britton and Brown's Illustrated Flora of the Northern United States, Canada and the British Possessions.*

This very showy wild flower was first made known to us through the collection made by Lewis & Clark, in their celebrated expedition across the continent, from which they returned in 1806. The plants of the expedition were turned over by the American Philosophical Society, whose members planned the expedition, to Dr. Barton, in whose employ was Frederick Pursh, one of the greatest of the botanists then studying the Flora of America. Up to this period, only one species of the genus was known, namely, *Gaillardia pulchella*, which was described, by Mons. Fogereaux, in the Memoirs of the Academy of Sciences of Paris, in 1786, the specimens having been collected in what was then the drier plains of the Great Missouri Territory. Pursh identified our plant with this genus, and published it in his "Flora of North America," in 1814, as *Galardia aristata*, stating that Lewis collected it "on dry hills on the Rocky Mountains." The specimen, from which he made his description, is still preserved in the Academy of Natural Sciences of Philadelphia. The expedition of Lewis and Clark occupied three years to go from St. Louis to the Pacific coast and return. The plants collected on their westward course were unfortunately lost, and only those found on their return fell into Pursh's hands. It was a serious loss to botanical science, for, as it was, those that came to hand proved invaluable, most of them being new to science. Captain Meriwether Lewis, the chief commander of this great expedition, has scarcely had full justice done him. It is not for a great man's contemporaries to see the importance of his work. Results must have some influence in a great question, and these one must wait for. He was born in 1774, in Virginia. The expedition was at first proposed to be under the charge of Michaux,—but as our relations with France at that time were strained, and Michaux was a Frenchman, it was thought better to send out some other, and Lewis, who was Jefferson's private secretary, was placed in command, with Captain Wm. Clark to co-operate with him. After the return of the exploring party, Lewis was made Governor of the Missouri Territory. The biographies say he committed suicide, in 1809. The author of this paper has gone over the evidence cited in support of this statement, and is surprised that this hypothesis has been accepted. It is far more probable that he was murdered, and the story of suicide was started, by those who murdered him, in order to cover up the crime.

The author made his first acquaintance with this plant in a tour through the Rocky Mountains, in 1871. Its favorite haunts in that region were on hill-sides, rather dry, partially shaded by scattering bushes, and mixed with other low-growing forms of vegetation. The plants bore the flowers singly, on a scape but a few inches high, while the flowers were very large for a plant of this diminutive size. The orange and brown flower-heads were very striking,—and suggestive of dwarfed sunflowers, or of some species of *Calendula* or marigold, to which genus, in fact, it is not distantly related. In other localities, collectors describe it as a much-branching plant, and, indeed, the variations, in other respects, are so great that some eminent botanists have been induced to form separate species on these differences. Pursh named the species *Gaillardia*

COLOR PLATE

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COLOR PLATE
INTENTIONAL SECOND EXPOSURE

aristata, in 1814, as a third species credited to North America, the first being *Gaillar diapulchella*, introduced to France, from Missouri Territory, in 1786,—and Michaux's second species being *Gaillardia lanceolata*, 1803, found in Carolina and Florida.

Stephen Elliott, in his "Sketches," refers to the southern plant as *Gaillardia bicolor*, and Nuttall, following, considered our plant as but a variety of this, and styles it *Gaillardia bicolor aristata*. Pursh, another botanist, makes another form, *Gaillardia rustica*, but which De Candolle, in 1834, (page 652—not page 362, as generally quoted), regards as synonymous with *G. lanceolata*. There are yet other authors who do not regard *G. lanceolata* and *G. aristata* as sufficiently distinctive to warrant separate specific designations. In referring to it as variety *aristata*, Nuttall says of it "indigenous to the grassy hills of the Missouri, abundant near Fort Mandan, and from thence to the mountains." The species, as fairly limited to Pursh's plants, is widely distributed over the northwestern part of our territory from the Mississippi to the Pacific Ocean.

The tendency to vary in its natural locations, already noted, has been taken advantage of by florists to raise numerous varieties, by selecting slight variations, and encouraging further wanderings by sowing the seeds. After successive generations, the slight deviations are further extended, and ultimately become fixed,—that is, variation can go only so far in a given line; when the limit is reached, the tendency to vary comes to an end. One of the most interesting of the garden productions goes under the name of the Lorenz Gaillardias. In this, all the ray florets are tubular, instead of strap-shaped as in the original. These florets are deeply four or five-cleft, and as they retain the purple brown color at the base of each, the contrast with the golden upper portion gives a coronæform appearance, to the head of disk florets, that is very pleasing. Another form is distributed in florists' catalogues as *Gaillardia grandiflora*. This has a particularly vigorous and branching habit, and is remarkably floriferous, starting to bloom about midsummer and continuing until frost arrives. The ray florets are in this more symmetrical than in the natural form. Indeed, the ragged appearance of the ray florets might be an argument against a claim for perfection of beauty in the flower as it appears in a wild state. But even in this respect, much will depend on the length of time the flower has been expanded. Our artist, in his faithful following of nature, has represented a flower in a faded condition in order to show the involucral bracts. The divisions, in this condition, are particularly loose (Fig. 5); but from the same flower he has taken one ray-floret in order to show us the ovarium and pappus (Fig. 2), and which we might say was prettily fringed rather than unduly ragged. The flower is probably in its handsomest condition when but partially open (Fig. 6); and rather more advanced than in this figure. The rich, crimson brown is then particularly striking, and the ray-florets are of more perfect form, and also of a brighter tint than when more advanced.

As a botanical lesson in composite flowers, our drawings will be welcome to the students of this very interesting natural order. There is often a striking difference between the root-leaves and the stem-leaves,—and the characters are in many cases reversed, as if nature loved to deal in contraries. In some species, the leaves at the base are cut and divided—the lyrate form prevailing—while the upper ones are entire; and in other species the lower leaves are entire, while the upper ones may be laciniate or pinnatifid. Our present species is just on the dividing line between these two extremes. All the leaves are more or less toothed; but the tendency to be entire increases as the floral stage approaches (Fig. 1.)

The genus was named in honor of M. Gaillard de Marentonneau, a French botanist of no especial celebrity, described by M. Fogereaux, well known as a historian and for general scientific aquirements, but with no particular celebrity in botanical pursuits. The specimen from which the description of the genus was made, was from plants raised from seed brought from the lower Mississippi. There has been much dispute about the correct orthography. Fougereaux wrote it *Gaillarda*, it was changed by those who succeeded him to *Galardia*,—but moderns generally write it *Gaillardia*.

EXPLANATION OF THE PLATE.—1. Complete plant from a Rocky Mountain specimen. 2. Complete ray floret. 3. Complete disk floret. 4. Head of faded florets. 5. Dorsal view of flower head.

WILD FLOWERS AND NATURE.

THE MOUNTAIN STREAM.

Cold and clear from the Mountain wells,
Mirroring brightly the green arcades,
Shattered to foam in the mossy dells,
Then gliding again through the silent shades,
The immemorial mountain stream,
With murmur sweet to its kindred calls,
And hastes to the river with distant gleam,
And fills the forest with waterfalls.

HOWARD WORCESTER GILBERT.

MEDICINAL VALUE OF GRINDELIA.—A correspondent states that "An extract of *Grindelia* is commonly sold in the drug stores, and it is an excellent cure for Poison Ivy if used early enough."

AMERICAN LOTUS.—I have read with much interest the contributions on American Lotus in the November issue, and also your description of it in August. I submit a few notes from my observations with this plant which are not confirmed by previous articles.

The flower of the American Lotus never floats unless by accident. This is contrary to the habits of all the Lotus or *Nelumbium* family. The Nymphæas float; both leaves and flowers of Nelumbiums rise above the water—often six feet.

The American Lotus does not open at night. It, as well as all the genus, is strictly day-blooming. It opens at sunrise. On the first and second days, it closes from 10 a. m. to 3 p. m. On the third day, it only partially closes, but opens out fully the following morning, and remains open day and night till the petals fall, which is usually the fourth and fifth days.

The seeds are slow to germinate. If gathered fresh and planted at once, the result is fair; but, if allowed to dry, they become hard as stone and will lie in water almost indefinitely without any sign of growth. The Indians called them "Seventy-year Acorns," because they thought it required that length of time for them to germinate. I have seen bushels of them drifted into the low bottoms of the Cumberland River, year after year; but have never heard of one seed germinating within fifty miles up or down the river. Once after keeping some planted for three years, I took them up and filed a hole through the shell that the water might penetrate the kernel, and they sprouted at once. Nearly every seed will germinate readily if treated thus. I associate with the American Lotus a great deal,—digging and selling hundreds of them every year,—but seldom meet a spontaneous seedling. They spread very rapidly from the roots, however.

A single plant, unmolested, will cover a pond of one acre within three years.

GEO. B. MOULDER.

BENEFITS FROM CROSS-FERTILIZATION.—"On reading an article, in a late issue, entitled 'Organography of Plants,' page 159-160, it is stated that, 'no proof has been furnished that cross-fertilization is of the slightest benefit to the race.' Was not that exquisite Begonia 'Gloire de Lorraine' the result of cross-fertilization, and is it not a benefit to the race?"

Worcester, Mass. J. C.

When Mr. Darwin, and others speak of "benefit to a race," it is in connection with the origin and permanence of a species. We know, by fossil-botany, that many species have existed in the past, that have no existence to-day, unfavorable conditions having destroyed them utterly. What evolutionists understand by "benefit to a race," is that certain conditions may aid the race in this so-called "struggle for life." Plants of one species that can change their characters to suit changing conditions survive—in other words become new species; while those that fail to change, perish. This is one of the doctrines taught in evolution. Mr. Darwin endeavored to prove this by assuming that a more vigorous growth in an individual plant,—the production of extra large seeds, and a greater number of them,—were evidences of "benefit to a race."

The paragraph referred to, by our correspondent, stated that there was no evidence that the

assumption is sound. On the contrary, the experience of gardeners is against it. Plants of high vegetative vigor are not as healthy as those of more moderate character,—and the larger seeds are not regarded as producing the best plants. As for the extra fertility of seed-bearing plants, those with high vegetative vigor are usually the least productive. Regarding extra seed production, that might be a point if nature had provided a place for every one to develop its full growth; but, as it is, many thousands are matured for every one that will have a chance to grow. If it were not so, and every acorn or apple seed that grew on the tree had a chance to germinate, they would starve out each other. Heavy production of seeds should be regarded as obstructing rather than aiding the advancement of the race.

Hybridism in the Begonia has certainly been a benefit to the race in the production of numerous beautiful forms equal in every respect to the species brought from their native homes; but in the matter of the longevity of their descendants, there is no evidence that the hybrids would endure for thousands of years longer than those species that had never been hybridized. In fact, the general belief is that they would be less enduring, though there is no evidence to confirm this any more than the opposite proposition.

GAILLARDIA STUDIES IN PLANT-LIFE.—A study of a floret of any member of the order of *Compositæ* is particularly instructive. This has to be done carefully by the aid of a good pocket lens, and is most instructive while the flower is fresh. There is seldom time for this when collecting,—and the soaked-out florets that have been wholly or partially dried are not as well suited to the study as the flower when fresh. Great differences will be found in the form of the floret,—a character which, on account of the difficulties already suggested, is seldom noted in botanical descriptions. In our enlarged Fig. 3, we see that the floret is nearly tubular, but slightly funnel-form as it nears the mouth, and that the five divisions are not cut deeply into the tube. The pappus is chaffy at the base; but the awns are of the length of the tube. The two style-branches are of unusual length,—as long, in fact, as the corolla, with considerably more than half of the upper portion papillose. Again, the positions taken will often furnish good distinguishing characters. In many composites, the style-branches recurve,—in this, as our sketch shows, there is a slight inward curve. The heads, also, have character worth noting. In this we see a large degree of permanence in the florets which dry and are preserved within the awns of the ovarium; while in so many species of the order they are early deciduous. In many other lines, *Gaillardia* will furnish material for special study.

THE LAST WILD-FLOWERS OF SUMMER.—Yesterday, I walked out through the woods on the shelving sand rocks, hunting for the last flowers of summer. I noted *Allium stellatum*, wild onion, and *Hypoxis erecta*, Star-grass, a plant of each still in bloom; and one plant of *Oxalis corniculata*, Sorrel, on the roadside, an emigrant from Europe. Dr. Gray says, in his "Manual," it is known, "if distinct from *O. stricta*, by the stipule at the base of the petioles." The stipules were present in this specimen and, besides, it had a small involucre of two bracts half way up the peduncle. The peduncles were one-flowered and were of a handsome shade of yellow, half-an-inch in diameter. We are having a mild and pleasant fall. F. K. STEELE.

Festus, Mo.

ROOT FUNGUS.—Among the immense number of plants described as belonging to the lower orders of vegetation known as funguses, very few are injurious, whether it may be organized as a mushroom, or whether it is so minute as to require a powerful microscope to discern it, most of them are beneficial to the higher organisms. In gardening, we have a number that trouble us by attacking either roots, stems, leaves or flowers; but they are few that prove very destructive in comparison with the whole number known. Among the Agaric, or, as we may say, the mushroom class, there is one that is exceedingly troublesome. This is the *Agaricus melleus*. When it attacks the roots of a plant, its effects are seen through the whole tree, by a change of the foliage to a paler green, and a tendency to throw out branches from the main stems. No one can mistake when a plant has been attacked by this species of root-fungus. Cuttings or grafts from the trees carry the ferment material with them, and the disease is thus widely spread. For large trees, no remedy has been found,—but for herbaceous plants and small shrubs, a thorough soaking with copper infusion has been found thoroughly effective.

The annexed engraving of the fungus is taken from our excellent contemporary, the *Canadian Horticulturist*, which has been giving a series of high-class articles, recently, on the diseases of trees and plants by fungus agency.

ABIES EXCELSA, NORWAY SPRUCE.—Trees, especially evergreen trees, like church spires, point heavenward. Once, on a winter day, I rode through a grove of spruce, hemlock and pine, laden with the gift of the snow-clouds, and the strange beauty of it all has never from memory quite faded.

In every clime, a tree is "a thing of beauty and a joy forever." How healing is the breath of the pine tree of the rocky hillside. And the apple tree is a sermon in itself, upon the results of culture. As Fredrika Bremer said in "The Neighbor," "Truly to comprehend, to value, and to admire the beautiful, is a great medium of ennoblement, of peace, of happiness." MRS. E. E. ORCUTT.

San Diego.

LATE WILD-FLOWERS IN WASHINGTON.—Severe frosts and cold weather, in October, seemed to kill most of our garden plants,—at least, they stopped blooming. But a few weeks of mild weather, with frequent rains, have revived many of them, so that we have quite a number of flowers opening now—Marguerite Carnations, candytuft, *Phlox Drummondi*, California Poppies, and clover, *Trifolium incarnatum*, *T. repens*, and *Medicago lupulina*. The foliage of *Petunia* and other flowers is fresh and green. If only more sunshine, we would have quite a variety of flowers.

Along the road, to-day, I noticed *Gaillardia*, *Solidago*, *Grindelia*, *Achillea*, and *Erigeron*, of two species; *Phlox linearifolia* is blooming more abundantly than any other. I noticed several patches of it, some of them yards in extent, *Potentilla gracilis* var., *flabelliformis*, *Collinsia parviflora*, *Capsella Bursa-pastoris*, and Violets are also quite abundant. I saw a few plants of *Castilleja miniata*. Doubtless, a walk through the woods and meadows would increase this list; but I think it is very good for the last of November. SUSAN TUCKER.

Cheney, Wash.

BARREN SUMAC.—Three or four years ago, one of your correspondents asked if there was a variety of sumac that did not bear fruit, and you wrote it was possible that some fruited every other year, but that there was no record of it, as the point had never been made before. I have examined into this subject since then. There were three groups of it growing near Waukegan, each group nearly circular, about eight feet high in the centre, gradually decreasing in size to the small plants just showing above ground. When I first made a note of them, there was a clear space of about ten feet between each group. Now they have spread so they have united in one group, covering about one acre of land. I have no doubt but that they have all spread from three plants, as there is no sign of a seedling among them. This year, two of the old groups are seeding very fully, while scarcely any can be found on the third one. Last season, the one that is barren now was fruiting, and the other two were not. There is no more beautiful sight in our native landscape than this group which is now taking on its fall coloring. The groups were originally triangular. Now that they are joined together, they form almost a semicircle and are flanked by White and Bur Oaks, which also form a background. The oaks are still dark green and the sumacs purple and golden.

Waukegan, Ills. THOS. H. DOUGLAS.

GENERAL GARDENING.

THE FRENCHMAN'S FLOWER.

The Scot may love his thistle-down,
Its prickly leaves and purple crown ;
And Erin on her shamrock smile,
The beauty of her emerald isle ;
The holly twine its glossy braid,
A starry wreath for Albion's head ;
We love the modest violet,
And dearer still the mignonette.

PERCIVAL.

FORCED RHODODENDRONS.—Plants such as the White Lilac, *Genista*, *Spiræa*, *Deutzia*, Harris' Lily, etc., are commonly forced for Easter decorations,—and they all please every one ; but a more frequent use of plants now but little used for such purposes would generally produce even greater admiration. It is not new to talk of forcing the Rhododendron ; but undoubtedly it is not common to see it. Yet a nice plant with six or more flower heads makes a beautiful specimen,—and like the Azalea can be used again—planted out or kept for forcing another year. To those in the northern parts of this country where such plants do not do well planted outside, the privilege to see them blooming indoors is great. About the time of blooming, they like an abundance of water if the pot be well-drained. Very little heat is required to bring them into bloom, though more than many others—about the temperature of a carnation house.

AMARYLLIS HALLII. — This beautiful bulb deserves a place in every garden, however small, where chaste flowers are appreciated. Its lovely, shell-pink petals, veined and clouded beautiful azure blue, are indeed superb. In some collections, this bulb has not proven hardy. Sometimes, however, I fear the cause has been (as it was with me) viz., the seedsman or bulb-merchant supplying the wrong variety. At other times the cause has been the utter unsuitability of location. It must be remembered that this bulb is a native of the Cape of Good Hope, and, as the temperature does not, of course, fall so low as here, yet certain ample modifications may be made to insure its hardiness. The bulb, when purchased in November, was planted six inches deep in a warm, sheltered spot. A good handful of sharp sand was placed beneath the bulb and then the hole was filled with light soil, and over all four inches of rough stable litter, and when May came in our wished-for friend, *Amaryllis Hallii*, also made its appearance.

This bulb, like all *Amaryllis*, (*Aulica platypetalus* excepted), makes its growth first, then loses its foliage, and in three weeks the flower stems push themselves up through the ground to a height of two to two-and-a-half feet. Each stem carries from five to eight flowers, and is a beauty for three weeks. The plant or bulb here this year pushed *eight* flower stalks with an aggregate of no more nor less than fifty-three flowers. All who follow above directions will not, I am pursuaded, be disappointed, as the bulb increases in strength very rapidly, although it multiplies very tardily.

Rahway, N. J. A. P.

REMOVING LARGE LIMBS OF TREES.—A correspondent writes :—"Will you kindly tell me, in the columns of the MONTHLY, the proper season of the year to cut large limbs from trees. I have a great number of trees, such as walnuts, chestnuts, lindens, etc., and I wish to cut off some of the lower limbs so as to have a better view and more air ; I want to do this in the proper season."

It is practicable to remove the large lower limbs from trees at any season of the year. There might be an exception to removing them in the summer time provided the number of branches removed is in excess of those remaining. This would tend to weaken the trees very greatly. The most favorable time for doing such work is in the winter. If left until nearly spring or early summer, the wounds will heal more readily, as while the sap is in motion new bark is made at once. In any event it is desirable to paint the wounds with thick ordinary paint or something that will keep out the air and moisture, until the new growth of wood covers the wound.

THE CANNON-BALL TREE.—Now that some of the West India Islands have become American possessions, the interesting classes of vegetation are receiving marked attention from visitors. From Mr. Joseph C. Roop, of East Stroudsburg, Pa., we have the following note :

"I know but little about the Cannon-Ball Tree, but it is very curious :—

The balls resemble cocoa-nuts in appearance, but are not edible, and I have never seen them cut open ; but some of our passengers took specimens to their state-rooms, and were glad to throw them overboard in a day or so on account of the intolerable smell they gave out. They hang on rope-like stems, and on the same stem may be seen buds, blossoms and matured fruit, or whatever you would call it. The flowers are thick and heavy, somewhat resembling the flower of a single hyacinth, and are of a pinkish color, sometimes tinged with yellow. We saw this tree in several of the West India Islands, but this one in particular was the handsomest specimen of all.

CANNON-BALL TREE.

I do not know whether it is a native of the places in which we saw it, but all we saw were single specimens and in the Botanical Gardens, as they call their parks."

This very curious tree is closely related to the myrtles. All these, however, have leaves dotted by oil glands, a character that aids largely in determining the relationship.

The Cannon-Ball Tree has nearly all the characters of the myrtaceous group, but has dotless leaves,—and on this account, with a few congeners, has been created into a separate order called *Lecythidaceæ*. It is the *Coarou-pita Guianensis* of botanists. When fresh, the fruit is delicious ; but, as our correspondent notes, after a few days it is as abhorrent as a piece of stale flesh. The shells are used for drinking purposes, as we use the shells of cocoa-nuts.

PROPER TIME FOR PRUNING TREES.—Many inquiries are made in regards to the proper time for pruning trees or shrubs, both ornamental and fruiting. It is impossible to answer except in a general way, as the individuals to be treated must be each one considered. Where

GENERAL GARDENING.

THE FRENCHMAN'S FLOWER.

The Scot may love his thistle-down,
Its prickly leaves and purple crown;
And Erin on her shamrock smile,
The beauty of her emerald isle;
The holly twine its glossy braid,
A starry wreath for Albion's head;
We love the modest violet,
And dearer still the mignonette.

PERCIVAL.

FORCED RHODODENDRONS.—Plants such as the White Lilac, *Genista*, *Spiræa*, *Deutzia*, Harris' Lily, etc., are commonly forced for Easter decorations,—and they all please every one; but a more frequent use of plants now but little used for such purposes would generally produce even greater admiration. It is not new to talk of forcing the Rhododendron; but undoubtedly it is not common to see it. Yet a nice plant with six or more flower heads makes a beautiful specimen,—and like the Azalea can be used again—planted out or kept for forcing another year. To those in the northern parts of this country where such plants do not do well planted outside, the privilege to see them blooming indoors is great. About the time of blooming, they like an abundance of water if the pot be well-drained. Very little heat is required to bring them into bloom, though more than many others—about the temperature of a carnation house.

AMARYLLIS HALLII. — This beautiful bulb deserves a place in every garden, however small, where chaste flowers are appreciated. Its lovely, shell-pink petals, veined and clouded beautiful azure blue, are indeed superb. In some collections, this bulb has not proven hardy. Sometimes, however, I fear the cause has been (as it was with me) viz., the seedsman or bulb-merchant supplying the wrong variety. At other times the cause has been the utter unsuitability of location. It must be remembered that this bulb is a native of the Cape of Good Hope, and, as the temperature does not, of course, fall so low as here, yet certain ample modifications may be made to insure its hardiness. The bulb, when purchased in November, was planted six inches deep in a warm, sheltered spot. A good handful of sharp sand was placed beneath the bulb and then the hole was filled with light soil, and over all four inches of rough stable litter, and when May came in our wished-for friend, *Amaryllis Hallii*, also made its appearance.

This bulb, like all *Amaryllis*, (*Aulica platypetalus* excepted), makes its growth first, then loses its foliage, and in three weeks the flower stems push themselves up through the ground to a height of two to two-and-a-half feet. Each stem carries from five to eight flowers, and is a beauty for three weeks. The plant or bulb here this year pushed *eight* flower stalks with an aggregate of no more nor less than fifty-three flowers. All who follow above directions will not, I am pursuaded, be disappointed, as the bulb increases in strength very rapidly, although it multiplies very tardily.

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INTENTIONAL SECOND EXPOSURE

considerable pruning is to be done, the need for a practical man with plenty of experience and a knowledge of all kinds of trees is evident.

In the case of fruit trees, it may be necessary to thin out the branches to permit the free circulation of air and light—very essential things to strong, healthy growth. Such pruning is done in the winter, any time after the leaves have fallen, though wounds will probably heal with greater ease if made towards spring. A careful painting of the wounds, however, makes it safe earlier. Should the growth of the trees be too straggling, they should be pruned lightly during early summer, while the sap is active and growth is being made. At the same time it will encourage the production of fruit buds, which are set on short spurs.

As regards the ornamental trees, the same rule will apply to the thinning out of branches; the weaker ones are, of course, to be removed, allowing the strong ones to remain. If they are to be put into shape, possibly a little pruning in winter and a little more in May or June, when growth is resumed, would bring about the desired results.

The flowering trees and shrubs must be pruned according to their respective characters. If it is desirable to retain flowering buds for the first season, most early-blooming plants should not be pruned very much until after they have bloomed, as the flowering buds are formed the season previous. Of course, a thinning out will do no harm in this respect, and will give much more strength to the remaining branches.

One correspondent asks if the end of March is too late to prune apple trees in northern New York. Following the above principles, it would not be,—in fact, one could prune in any month if it is done judiciously with an understanding of the results that would follow.

EXPANSION OF TREES.—Much error is diffused by the use of improper terms. A work on forestry, before the writer, referring to attachment of labels or guards to trees, remarks that "it should be by copper wire, which stretches as the tree expands." But there is no expansion of a tree in a physical sense. A wave flows over the sand by the sea-shore,—but not by expansion of the waters. In like manner the new wood of trees flows over the older wood,—but this is not expansion. If the wire attachment to a label be loosely over a horizontal branch, and yet so firmly that it will not be disturbed by the wind, the wire will be covered by the new growth, though there be plenty of room in the wire loop for expansion.

DISEASE IN THE ENGLISH BIRCHES.—It has been assumed that the disease, in the English Birches, that has become so prevalent over a wide area in the United States, came to us from the Old World. A recent issue of the London *Gardeners' Chronicle* seems to confirm this. It says :—

"Writing in *Nature* of October 18th, Mr. Robert Paulson mentions that the Birch trees in Epping Forest have been attacked by a disease which causes them to die very rapidly. The disease is attributed to the presence of a fungus—*Melanconis stilbostoma*."

BEAUTIFUL AUTUMN LEAVES.—Few plants display a more wonderful coloring of foliage in autumn than the blackberry. The shade of color is uniform and the beauty lies chiefly in the green veining of the leaves. The leaves of the Scarlet Oak are admirable for decorative purposes, being persistent and therefore less likely to destroy effects by falling or drying up quickly.

FOREST PLANTING.—MEEHANS' MONTHLY has always contended that there was no reason why joint stock should not be formed for profitable forest culture. Year by year, the tree-covered land would increase in value as the trees approach nearer and nearer maturity, and thus bring a bonus for the stock. The writer knows of a piece of forest land bought by a friend, not so very many years ago, for fifty cents an acre, and which recently brought an offer of $100 an acre for the privilege of cutting off the timber. We learn, by a recent issue of the excellent journal, *The Forester*, that one such company is actually being formed to be known as the American Reforestation Company. Its headquarters is in the office of the *American Lumberman*, of Chicago. It is proposed to start with 350,000 acres, and plant White and Red Pine. Wisconsin and Michigan seem to be the States chosen for the experiment.

NEW OR RARE PLANTS.

THE GINGKO TREE.—References to the fruiting of the Gingko, or Maiden-hair tree, in recent issues of MEEHANS' MONTHLY, have brought many letters from obliging friends in various parts of the country noting that seed-bearing specimens are not infrequent. In former times, it was supposed that the tree was simply dioecious,—that is to say, having some specimens wholly male and others wholly female. *Flores dioici* is indeed one of the characters of the genus, as given by Prof. Parlatore, in that standard work, De Candolle's *Prodromus*. It is really polygamous,—that is to say, while some trees have wholly separate sexes, others have both kinds on the same plant, just as many conifers have. This accounts for individual trees, completely alone, often being abundantly fertile.

ILEX CRENATA IN FAIRMOUNT PARK, PHILADELPHIA.

ILEX CRENATA.—Annexed, we give an illustration of a noble member of the holly family, growing in Fairmount Park, Philadelphia, from a photo, taken by Miss Marie Thackara. When we talk of holly, the famous *aquifolium* of Europe comes to mind,—and, indeed, this, with its numerous varieties, constitute about all any of us know of the holly family. But there are numerous species, many of great beauty, besides the celebrated one of old England. A number are natives of Japan. This one was described as *Ilex crenata*, by Charles Peter Thunberg, who, in 1784, wrote a "Flora of Japan"; but it is only during comparatively recent years that its beauty has become known to cultivators. So far as we know, the Fairmount Park specimen is the finest in the United States.

CEDRUS ATLANTICA.—Trees give us pleasure by their beauty, as well as for the grand natural scenery in which they take a prominent part. But many give additional interest by reasons of their historic associations, and are frequently esteemed especially on this account by intelligent garden-lovers. Few historic trees do more for us in this line than the Cedar of Lebanon. It is the "Tree of Life" that had such a sentimental place in the ancient Babylonian mind,—the tree from which was provided the ancient Egyptians' burial caskets,—and memorably the cedars which aided Solomon in building the famous temple at Jerusalem. Mount Lebanon was at one time completely clothed with vast forests of them, and it is said some trees are still left on this historic spot. There are yet, however, other mountains in Cilicia, and perhaps elsewhere, from whence supplies can be obtained.

In the case of the Cedar of Lebanon, as of other trees, there are what are known as geographical varieties,—that is, the same thing

with slight variations,—and what is known in nurseries as the Atlantic or Mt. Atlas Cedar, is one of these. It differs from the originally known Cedar of Lebanon in its more conic growth, its bluish-green foliage, its smaller cones, and these cones borne on short spurs on branches. It is not infrequent on the Mountains of Cilicia, but seems most at home on Mount Taurus. It is very hardy, but like most coniferous trees, is fond of company, and thrives better when in groups with others.

The beautiful specimen here illustrated is from a photograph taken by our correspondent,

CEDRUS ATLANTICA.

Mr. John W. Duncan, and kindly sent by Mr. Robert Williamson. It represents a tree growing on the grounds of his employer, Mrs. A. A. Anderson, Greenwich, Connecticut, where are very many other fine, rare specimen evergreens. As may be noted, the tree is about twenty-five feet high. Many mountain conifers become more glaucous in proportion to altitude, and the seedlings mostly reproduce the acquired glaucous character. These are known in cultivation as *Cedrus Atlantica glauca*, to which class this specimen belongs.

FRUITS AND VEGETABLES.

CAMPBELL'S EARLY GRAPE.—Mr. Geo. S. Josselyn sends a basket of Campbell's Early Grape. The bunches are large, berries deep black and of the size of Damsons, the flavor very sweet. Mr. J. says they ripen at the same time as Moore's Early, and are of equal quality but become better than this good grape by being left a while on the vine. He has had them remain on the vines for ten weeks—even till frost came. It is also a remarkably abundant bearer.

CAPRIFIED FIGS.—What has been recently said, in MEEHANS' MONTHLY, regarding fig-culture in the Northern States, has created wide-spread interest and discussion. Mr. Geo. C. Roeding, of Fancher Creek Nursery, Fresno, California, places us under great obligations by sending us a box of "Smyrna Figs," as they have them, in a commercial condition. Of the figs themselves, we can safely say, that they are equal to the very best that come to us from the Old World. The State of California should do public honor to these intelligent and energetic men, who have done so much to

place her people among the world's foremost contributors to the welfare of the human race.

The matter is of such a national as well as individual interest, that we give in full what Mr. Roeding says of it,—only remarking here, that the subject may be taken up again hereafter.

"The figs in this package are genuine Smyrna figs grown on the Fancher Creek Nursery, seven miles east of Fresno, California, and are the first produced on a commercial scale in the United States.

The trees were grown from cuttings taken from the famous Aidin district, in the interior of Asia Minor, distant about seventy-five miles from Smyrna. Mr. W. C. West was sent to Smyrna, in the year 1885, by Mr. F. Roeding, for the purpose of making a personal examination into this subject and bringing over cuttings of the very best Smyrna figs. The expense of the trip and the securing of the cuttings amounted to $3,000.

These figs represent experiments extending over a period of fourteen years, and the care and cultivation of sixty acres, or 4,200 trees from 10 to 14 years' old.

They have never been sulphured or processed in any way—the color is natural. They are sweeter than any figs ever produced in the United States. An average sample of these dried figs, according to a recent analysis made by Professor Hilgard, of the University of California, showed that they contain 63.92 per cent. sugar, which is 1.42 per cent. sweeter than the imported Smyrna fig.

They contain fertile seeds, giving them an exquisite, nutty flavor found in no other fig grown in the United States. Each seed represents a single flower.

To produce a fig which, when dried, would equal in flavor and sweetness the fig of commerce so universally esteemed, has been the desideratum of every horticulturist interested in fig culture.

To all outward appearances, the fig tree, unlike other trees and plants, develops fruits without first producing flowers. But these appearances are misleading, for on cutting the fruit open it will be found that it contains a large quantity of inconspicuous flowers closely grouped around the rind, which is really the receptacle for them.

Furthermore, there are four distinct kinds of flowers found in the figs, namely: male. female, gall and mule flowers. Male, female and gall flowers are found in Capri or Wild figs, the number varying in greater or less degree in the various crops.

The essential point of difference, between the Symrna class of figs and the Adriatic class, lies in the fact that the Smyrna contains nothing but female flowers, and that unless they are pollinated, either artificially or through the agency of the fig wasp, *Blastophaga psenes*, the fruit never reaches maturity, but shrivels and drops from the tree when one-third grown. The Adriatic, of which there are fully 100 varieties growing in this State, contain mule flowers which cannot be pollinated, but which, nevertheless, develop and mature edible fruits, although the seeds are sterile.

In other words, the Smyrna fig is valueless unless the flowers have been caprified; while the Adriatic, and that embraces all varieties of figs which have matured their fruits in the past without the aid of the insect, cannot be improved upon nor benefitted in any way, for their flowers cannot be fertilized.

The first Smyrna figs grown in the United States were produced on the Fancher Creek Nursery, in a very limited number, in the year 1890, by transferring the pollen from the Capri figs and introducing it into the Smyrna fig by means of a tooth-pick. All figs treated in this manner developed into large, fine fruits with perfect seeds; while untreated figs shrivelled up when about the size of a marble and dropped to the ground, thus proving conclusively that caprification was an essential factor in the production of this fig.

The Capri fig stands in the relation of male to the Smyrna or edible fig. It occasionally produces an edible fruit but without flavor, its principal value being that it is the habitat of the *Blastophaga*, for without it the insect cannot exist.

The propagation of the fig wasp takes place in the following manner, in the June crop of the Capri figs, and it is the same in all succeeding crops:

The male insect, which is wingless, is the first to appear from the galls. It crawls around in the fig and, with its powerful mandibles makes an opening in the galls in which the females lie and impregnates them, and then perishes within the fig in which it was born.

The female insect, which is winged, enlarges the opening in the gall made by the male, crawls through the zone of male flowers surrounding the orifice of the fig, its body becoming covered with pollen in its outward passage, and either enters the following crop of Capri figs, depositing its eggs in the gall flowers from which a new generation of insects is developed later; or, if the fig has been removed before, and hung in the branches of a Smyrna fig tree, the wasp forces its way, losing its wings in the operation, into the female fig, then in the proper state of maturity to admit its entrance, and in its endeavors to lay its eggs, and laden with pollen obtained in its outward passage from the Capri fig, fertilizes the female flowers and perishes, leaving no offspring, the female flowers being so constructed that it cannot deposit its eggs.

All Smyrna figs thus entered produce fertile seeds, develop and expand, and although the wasp sacrifices its own life, it paves the foundation for the propagation of the fig tree as well as for the production of a fruit which would otherwise be worthless.

The Smyrna fig commences to mature about the middle of August and continues to ripen its crops until the latter part of September.

The figs are allowed to drop of their own accord and are practically dried when they fall. The process of drying is very simple. The figs are gathered from the ground every other day, transferred to the drying ground, dipped into a boiling brine made by dissolving three ounces of salt to a gallon of water, and then placed on trays, the time of drying varying from two to four days according to the weather. The dipping of the fig hastens the drying and makes the skin pliable.

After the figs are dried, they are placed in sweat boxes where they are allowed to remain for two weeks to pass through a sweat. These boxes hold about 200 pounds each. The only other treatment they receive before packing is to wash them in cold salt water for the purpose of removing all dirt and floaters, the latter being figs which are overdried or improperly fertilized and which rise to the top when placed in the brine."

ABNORMAL SECKEL PEARS.—I am glad the pears (see page 174) were of enough interest to elicit comment in the pages of the MONTHLY. My theory, in regard to the *bees*, was based partly on this: Last year, the pear and apple trees bloomed at the *same time;* usually the apples bloom first.

Secondly: The drought may have had a modifying effect in causing the pear to degenerate, —so to speak,—for in the order of differentiation, is not a pear a variety of apple? The apple could not put on the pear shape in one season, as the pear is the higher evolution and the result of a long series of selection. The son of a gentleman might become a boor in one generation; but the son of a boor could not become a gentleman in that time. This is my impression of the order of development. If by "carpellary structure," this means the flesh of the pear, it was greatly changed in most of them,—both in structure and flavor. They were coarser grained and less sweet in flavor, so that the family avoided them when they could get one of the regulation shape.

Our trees have borne exceptionally large fruit, and superior in flavor; but how this freak was caused this year is a mystery

Our Bellflower Apple tree, close to the Porter tree, has also taken on the Porter shape and color to some extent, and ripens earlier than it should if it was a true Bellflower. How the change has come about, I do not know.

(MRS.) SUSANNA M. GASKILL.

Swarthmore, Pa.

To the above interesting details connected with the apple-formed Seckel Pears, it seems useful to note that, by "carpellary system" is meant the whole covering of the seed as prepared by the parent plant. The seed itself is a new individual springing from a single cell that has been aided in its development by a grain of pollen from another individual. The effect of this union can only be on that which follows. There cannot be, philosophically speaking, any influence on that which is past. Experiment sustains philosophy. The writer can recall no case where those, who have carefully experimented, found any retro-active results. On the other hand, he does remember, though he cannot now note the exact reference, where careful experiments were made on the common stock-gilly. White ones were pollenized with purple; and purple-flowered ones were fertilized from the white blossoms. The cotyledons on seed-leaves showed the color or want of color in each case. There was no difference of tint in the coverings of the seed, as there is in cases of self-fertilization, where the pinkish tinge is evident throughout.

The whole subject is one of great interest, and deserves more careful experimentation than it has yet received.

NOTES ON VEGETABLES.—*Large Yields.*—I once raised forty merchantable potatoes from one large potato, planted whole and alone.

Wild Potatoes.—These potatoes were recently secured from the mountains of Mexico, the native home of our domesticated potatoes.

In digging my crop, one fall, I found one old potato that was as sound as when I planted it, and as I have an experimental turn of mind, I saved it to plant again the next year to see if it would raise a second crop, and, sure enough, it did, and a bountiful one, too, for it produced one hundred and twenty-five. I planted it alone and by itself.

Danverse Onions.—On forty-four square rods of ground, I once raised two hundred and ten bushels of merchantable onions.

In 1898, in ten inches of row, I had three pounds of onions, the seed occupying only six inches in the row.

Hubbard Squash.—From one transplanted plant, I raised sixteen fine squashes.

Oat Yield.—From one kernel of Norway Oats, I raised fifty-three stalks, and thirty odd (I have forgotten the exact number) heads. From an average head selected, and the kernels counted, it was estimated there were, in all, 6,441 kernels from the one planted.

A Prolific Sun-flower.—This yield of flowers on *one* stalk I have never seen beaten.

When all were blown, I cut the branches, one by one, counting each separately so as to not be liable to count any twice, and the number was 125.

A Prolific Tomato Plant.—From one single plant, I have raised, this year, 100 tomatoes.

Moscow, Vt. TIMOTHY WHEELER.

HOUSE CULTURE OF THE FOREIGN GRAPE.—The time will probably come, in America, when the European Grape will again be a valuable commercial fruit. It was at one time, the fruit selling readily at $1.50 a pound. The cultivation went down for several reasons, among them the fear of competition with the out-door grown European grapes from California, the injury to the roots by the phylloxera, and the difficulty of getting the intelligent labor to manage the vines properly. It is clear, however, that no more fear of competition with the Californian product need be feared than with the Spanish grapes that come in barrels of cork dust from the Old World. These are very good in their way, and will usually bring remunerative returns though the figures be small. There is no comparison between these in quality as compared with those grown under glass, by one who knows his business. This has been abundantly proved in England. The Spanish grapes come to England and are sold by auction by the 10,000 barrels at a time, and bring no more than sixpence or ninepence a pound in the famous Covent Garden Market. While the home-grown Muscats and Black Hamburgs bring comparatively enormous prices.

In our country, it was once thought to be absurd to try to raise tomatoes at a profit under glass in winter, on account of the shipments from Florida and the West India Islands. But it has been found a profitable business of late years, by reason of the superior quality of the home-grown article.

FIGS AND HARDY ORANGES. — Regarding the notice of my fig gatherings in the MONTHLY, your six pounds is modest. I have picked over twenty pounds, and only yesterday picked seventeen pounds at one time, and could have gotten several pounds more. The crop this year has been very large.

My *Limonia* had 213 ripe oranges by actual count after quite a number had been taken off.

THEO. D. RAND.

RAISING NEW VARIETIES OF APPLES.—For all the great number of varieties of apples that have been named and distributed, very few, in comparison, have proved general favorities. There is still room at the top, as they say of the learned professions. Those who have large apple orchards, and have still a little ground to spare, might well let a dozen or two seedling apples grow up to bear fruit. If they proved of less importance than others already thought worthy of a name, they could soon be turned into profit by top-grafting with desirable kinds.

BIOGRAPHY AND LITERATURE.

DAYS WELL SPENT.

O what a glory doth this world put on
For him who, with a fervent heart, goes forth
Under the bright and glorious sky, and looks
On duties well performed, and days well spent!
For him the wind, aye, and the yellow leaves,
Shall have a voice, and give him eloquent
teachings.
He shall so hear the solemn hymn that Death
Has lifted up for all, that he shall go
To his long resting-place without a tear.

LONGFELLOW.

HISTORY OF THE COFFEE TREE.—Mr. H. Witte, a well-known horticulturist of Leyden, gives Kaffra, in the southern part of Abyssinia, as the native place of the coffee tree. He mentions Arabian legends, as samples of strange customs in connection with its use. It was not till centuries after its use that it was carried to Java, from whence the first samples were received, in 1706. A tree from Java was then sent to the Botanic Garden in Amsterdam, and when it flowered and ripened seeds, a young seedling was presented to Louis XIV. From this plant, seedlings were sent to Martinique,—and from these plants, again, seedlings were sent to Jamaica, Cayenne, and St. Domingo; while from Amsterdam, plants were sent to Surinam. In fact it was from the one plant, sent from Java in the beginning of the 18th century, by Governor General Van Hoorn, that everything in the French possessions and the West Indies has sprung. In this way has travelled the progeny of the original coffee plant, introduced from Arabia through Burgomaster Nocoloos Witsen, at the end of the 17th century.

Is it not remarkable that we should owe, in this small beginning, so much to the wealth and prosperity of the Netherlands and its possessions, Java, Sumatra, Celebes, etc.,—to say nothing of the industrial development and prosperity of the whole world? In the Dutch dependencies alone, the annual product is estimated at about 70,000,000 kilos (pounds).

Before I left Holland, I read in the papers that much success was following an effort to graft the ordinary coffee plant on the much stronger-growing Liberian species, but I do not know the final result. P. OUWERKERK.

Jersey City, N. J.

CLASSIFICATION OF THE GINGKO.—Mr. Ezra Clift, Buffalo, N. Y., says:—"Speaking of the *Salisburia* or Gingko Tree, I think it a mistake to class it with the conifers, as we have one here which is bearing fruit that resembles yellow fruited plums."

If we translate "conifers," and say cone-bearing plants, surely the Gingko cannot be one of them. But there is really not much difference in the structure. In this plant the disk, dry in the pines, becomes fleshy and wholly covers the seed. In the yew it is also fleshy, and half covers the seeds.

At the same time it may be said that many eminent botanists agree with Mr. Clift, that for this and other minor peculiarities, they should not be classed with the pines.

Dr. Lindley, indeed, made a distinct order of the yew family, which he termed *Taxaceæ*, in which the Gingko would be placed. With this view, it would be the correct thing to speak of the Gingko as of the yew instead of the coniferous family.

LITTLE NELL IN GARDENING.—Art critics in other cities have commented on the bad taste they believe they find in the artistic adornments of Fairmount Park, in Philadelphia. Many, they assert, are out of character with their surroundings. But this verdict can scarcely apply to the representation of Dickens' Little Nell, an illustration of which is given with this paragraph. Little Nell might well be taken as a symbol of gardening. The love of flowers comes in as a relief from all material surroundings. The business man, harrassed by the cares of city details, hurries to his rural home of an evening to bury his cares among the flowers,—and even the tired artisan feels a rest when working till late at night among the vegetables in his little yard. The wisest reformers in the city slums do their best work, when they carry a few pots of flowers to the unfortunates,—and those who visit the prisons or reformatories tell us that, with an introduction by the aid of a few flowers, they can the sooner reach the hearts of the depraved. Flowers for the sick; flowers for the hospitals; flowers in sad events, as well as flowers for joyous occasions, are always a power. Just as Little Nell's goodness among the vicious and depraved conditions that surrounded her, so are

DICKENS AND LITTLE NELL.

flowers among the woes and ills of humanity. Dickens' Little Nell might well be taken as the patron of gardening.

The Fairmount Art Park Association has not yet wholly secured this beautiful piece of work,—nor has the site yet been selected by the Commissioners of Fairmount Park. The association would be glad of further subscriptions towards securing the sum needed, and would be equally pleased with any suggestions as to a suitable site for the pedestal. The thoughts expressed in this paragraph would indicate, in a general way, the character of a locality that might be chosen.

AMONG THE MUSHROOMS.—By Ellen M. Dallas and Caroline A. Burgin, Philadelphia, published by Drexel Biddle, 228 South 4th Street. A notice of the prospectus of this little book of 175 pages has already appeared in MEEHANS' MONTHLY. The book itself does full justice to what was expected of it. The Mushroom family has attracted more than usual attention lately, and the general public has been impressed with the fact that it knows little about these interesting plants. The desire to know more has resulted in the appearance of many treatises, all very useful. Many of these, however, are too learned for common use. They cover too much ground,—or in descending, as they think, to public comprehension, strike too low, and become trifling. For scientific accuracy brought within popular comprehension, "Among the Mushrooms" is a rare success.

GENERAL NOTES.

PUBLIC BOTANIC GARDENS.—C. W. G., Merchantville, N. J., says :—"Why does not Philadelphia possess a first-class botanic garden? We could easily beat Kew all to pieces. I spent a day—an instructive one—at Kew, but came away disappointed; wondering why, with such resources at its back, and with world-renowned botanists at its head, it was not ten times as good as it really is."

It would be difficult to establish a botanic garden in any American city to beat Kew, viewed simply as a botanic garden. The main objects of Kew are national. At the same time, the whole world participates in England's advantages. One cannot talk about plants understandingly without knowing them, any more than he could talk understandingly to a wagon builder without knowing the names of its various parts. The great herbarium, economic museum, and collection of living plants which Kew possesses, supplies this opportunity for knowledge. By this thorough knowledge of plants, it is able to act intelligently in regard to the valuable plants for its colonies and industrial enterprises,—the plants themselves being propagated in the gardens and freely distributed to experimenters. The mere gardening features of Kew are secondary,—and were only inaugurated by Sir William Hooker, under the happy thought, that as the whole people—that is the nation—supported Kew, the people at large, as well as specialists, should get some pleasure from the money expended.

As a mere public garden, it would not be difficult to outmatch Kew.

CORK.—The Cork Tree is an evergreen, an oak, *Quercus Suber*, about the size of our Apple tree, and grown largely in Spain for commercial uses. The bark is stripped in order to obtain the cork, which is soaked and then dried. The moment the bark is peeled off, the tree begins to grow another cork skin, and each new one is better than the last; so the older the tree the better the cork. The trees are stripped about every eight years, and so strong does it make them that they often live to the age of 200 years. After the bark is stripped off, it is trimmed and dried and flattened out. Then it is packed and shipped to all parts of the world.

FIG FUNGUS.—The *Gardeners' Chronicle* says that the fig fungus, *Cercospora Bolleana*, is very destructive to the leaves of the fig, and that it has travelled from the Mediterranean region to the Argentine Republic on this continent. No serious attempt, it is said, has been made to arrest its progress. It may be noted that another species of the same genus, *Cercospora Sequoiæ*, comes east from California with seeds and plants of the great tree *Sequoia gigantea*. It is an extremely destructive fungus and has almost wholly prevented its success in Atlantic States. The Bordeaux mixture has been found an effectual remedy.

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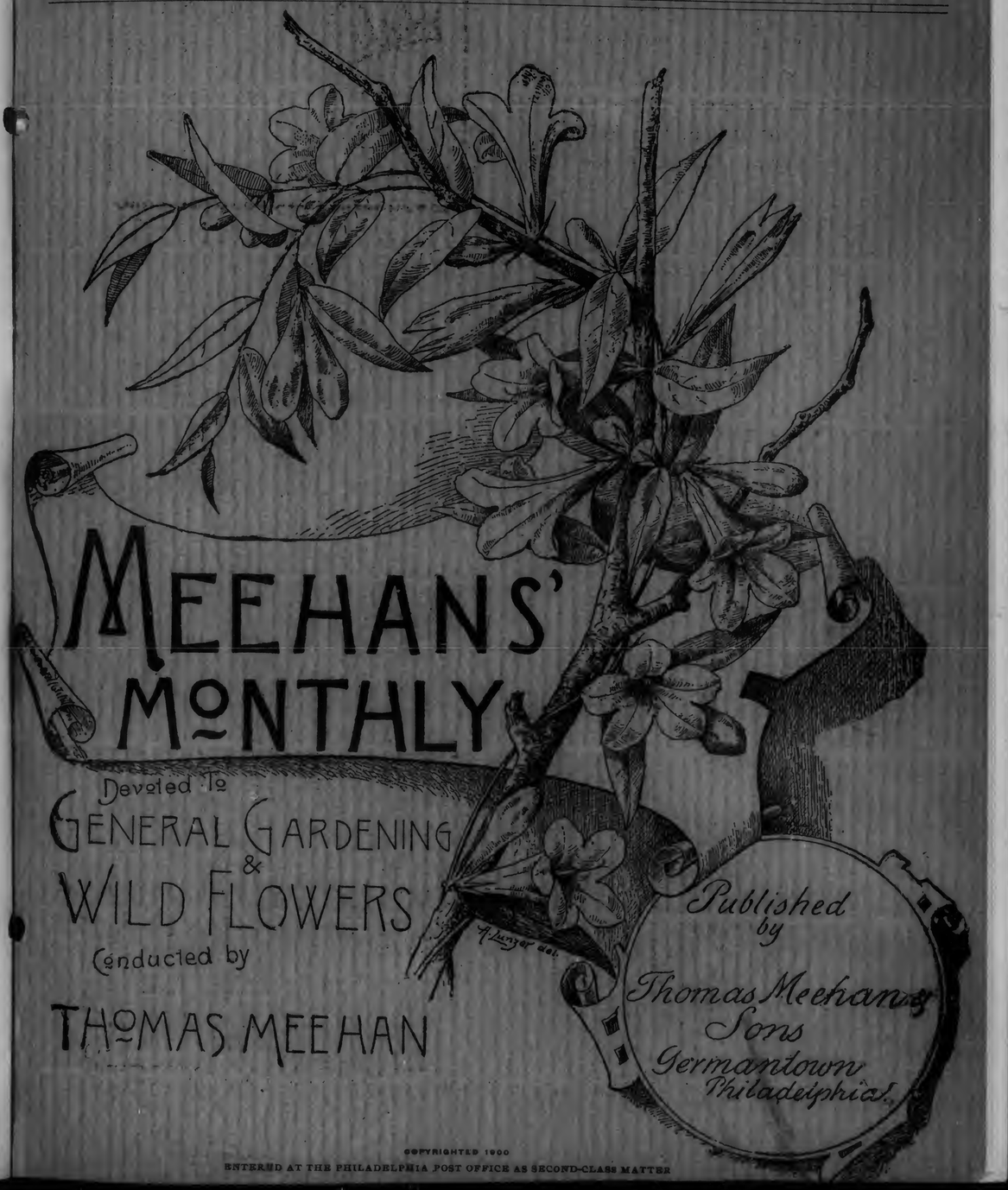

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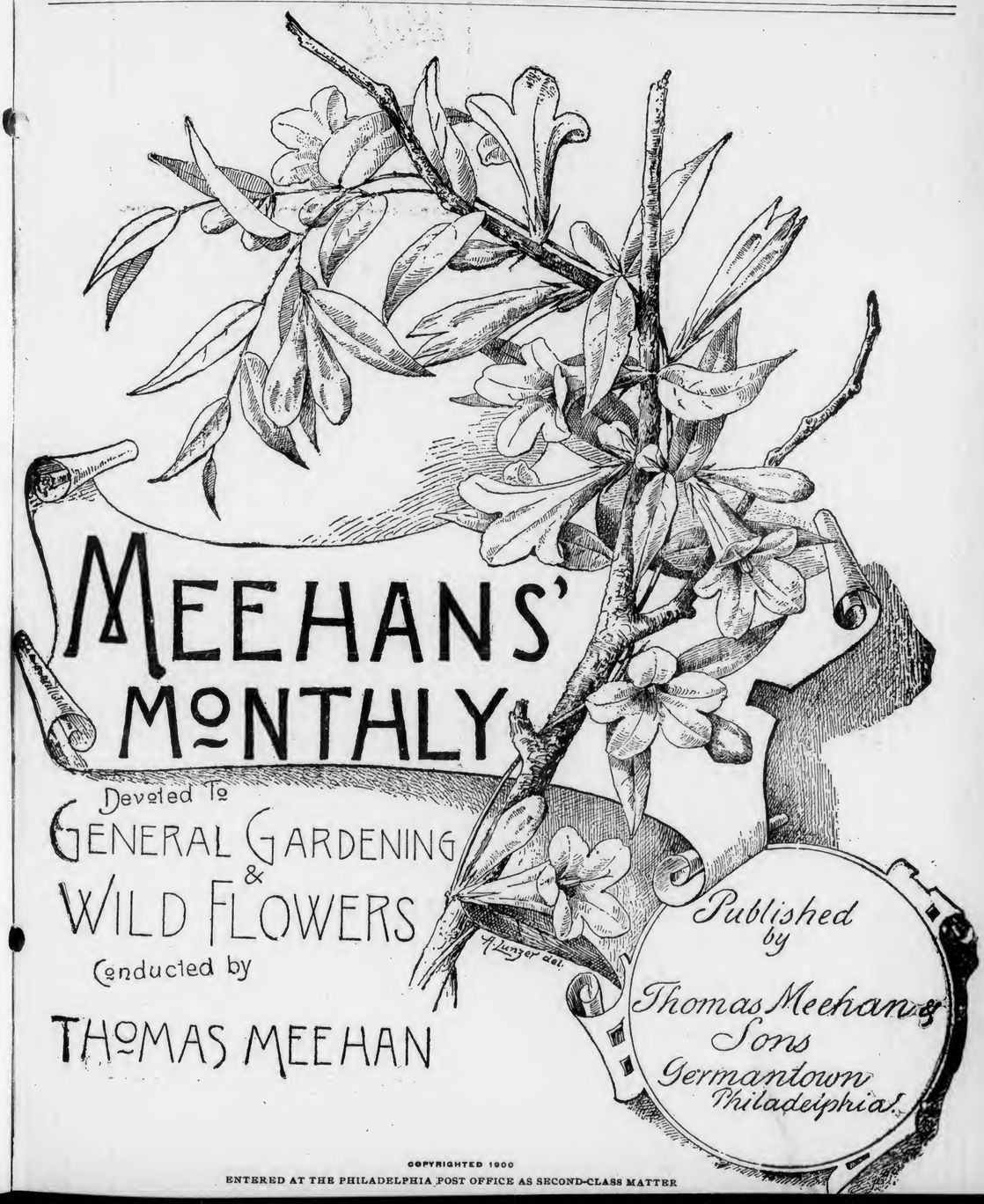

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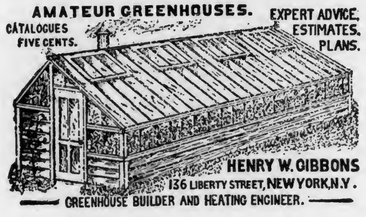

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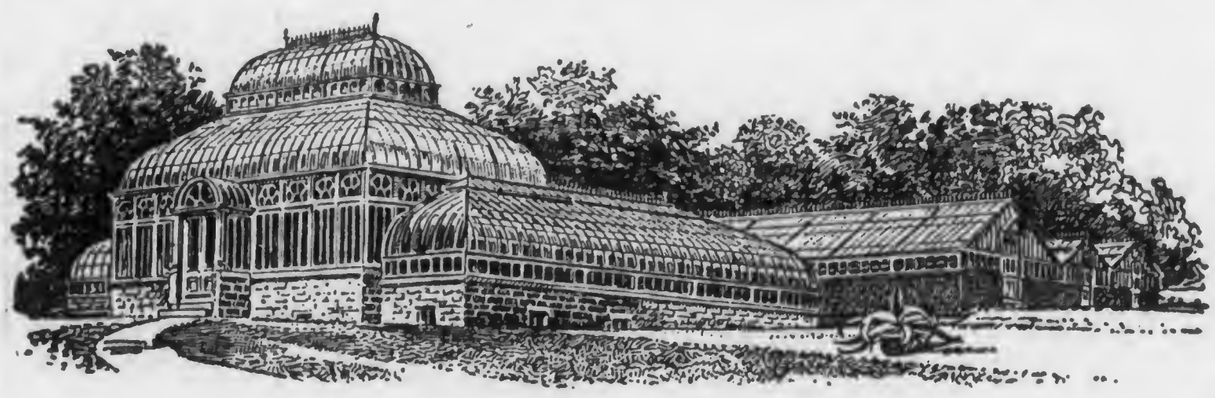

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